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BUSINESS ADMINISTRATION

BY

LEON CARROLL MARSHALL

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PREFACE

Collegiate training for business administration is now so widely attempted that the time has arrived when experiments should be conducted looking toward the organization of the business curriculum into a coherent whole. Training in scattered "business subjects" was defensible enough in the earlier days of collegiate business training, but such a method cannot be permanent. It must yield to a more comprehensive organization.

There can be no doubt that many experiments will be conducted looking toward this goal; they are, indeed, already under way. This series, "Materials for the Study of Business," marks one stage in such an experiment in the School of Commerce and Administration of the University of Chicago.

It is appropriate that the hypotheses on which this experiment is being conducted be set forth. In general terms the reasoning back of the experiment runs as follows: The business executive administers his business under conditions imposed by his environment, both physical and social. The student should accordingly have an understanding of the physical environment. This justifies attention to the earth sciences. He should also have an understanding of the social environment and must accordingly give attention to civics, law, economics, social psychology, and other branches of the social sciences. His knowledge of environment should not be too abstract in character. It should be given practical content, and should be closely related to his knowledge of the internal problems of management. This may be accomplished through a range of courses dealing with business administration wherein the student may become acquainted with such matters as the measuring aids of control, the communicating aids of control, organization policies and methods; the manager's relation to production, to labor, to finance, to technology, to risk-bearing, to the market, to social control, etc. Business is, after all, a pecuniarily organized scheme of gratifying human wants, and, properly understood, falls little short of being as broad, as inclusive, as life itself in its motives, aspirations, and social obligations. It falls little short of being as broad as all science in its technique. Training for the task of the business administrator must have breadth and depth comparable with those of the task.

BASIC ELEMENTS OF THE BUSINESS CURRICULUM

CONTROL

1. Communicating aids of control, for example
   a) English
   b) Foreign language
2. Measuring aids of control, for example
   a) Mathematics
   b) Statistics and accounting
3. Standards and practices of control
   a) Psychology
   b) Organization policies and methods

Of problems of adjustment to physical environment
- *a*) The earth sciences
- *b*) The manager's relationship to these

Of problems of technology
- *a*) Physics through mechanics, basic, and other sciences as appropriate
- *b*) The manager's administration of production

Of problems of finance
- *a*) The financial organization of society
- *b*) The manager's administration of finance

Of problems connected with the market
- *a*) Market functions and market structure
- *b*) The manager's administration of marketing (including purchasing and traffic)

Of problems of risk and risk-bearing
- *a*) The risk aspects of modern industrial society
- *b*) The manager's administration of risk-bearing

Of problems of personnel
- *a*) The position of the worker in modern industrial society
- *b*) The manager's administration of personnel

Of problems of adjustment to social environment
- *a*) The historical background
- *b*) The socio-economic institutional life
- *c*) Business law and government

Stating the matter in another way, the modern business administrator is essentially a solver of business problems—problems of business policy, of organization, and of operation. These problems, great in number and broad in scope, divide themselves into certain type groups, and in each type group there are certain classes of obstacles to be overcome, as well as certain aids, or materials of solution.

If these problems are arranged (1) to show the significance of the organizing and administrative, or control, activities of the modern responsible manager, and (2) to indicate appropriate fields of training, the diagram on the opposite page (which disregards much overlapping and interacting) results. It sets forth the present hypothesis of the School of Commerce and Administration concerning the basic elements of the business curriculum, covering both secondary school and collegiate work.

In this curriculum the present volume is designed to serve as part of a general introduction. It is used as the basic material in a beginner's course in Business Administration. This course parallels another dealing with the physical environment of business and follows still another which considers social environment. The three courses thus constitute a survey of the physical and social environments of business and a general analysis of the outstanding relationships of the business administrator.

In its scheme of presentation I think of this volume as being made up of four parts. Chapter i, a very brief first part, presents a general view of the field of study and a certain mental attitude toward the field. Because I have no better term for this mental attitude, I call it a functional approach to the study of business administration. Chapter ii, a somewhat longer second part, examines a business problem—that of plant location—as a means of giving the student confidence in the analysis of business problems which is sketched rather abstractly in the first chapter and as a means of inducing him to think of the outstanding relationships of the administrator as highly interdependent activites.

Chapters iii–ix form a rather bulky third part of the book. Here, one after another of the functions of the business administrator is discussed, with particular reference to the character of the problems involved and to the control policies and devices of the manager. The reader will find that the book is a "what and why" book rather than a "how" book. It is not a manual of technical

practices and devices in business. It is an attempt to see the problems of business administration as an interrelated whole and to indicate the lines of study which will presumably lead to solution of those problems.

Chapter x, the brief fourth part, presents in moderate detail a "business case" for the student to analyze. It is a sort of an acid test of his earlier study.

From the point of view of teaching technique, this study of business administration is worked out through what is called, again for lack of a better name, the discussion method. Questions, problems, and cases are the tools of the discussion method and all are employed in this book.

Some ways of using these tools may be illustrated as follows: If a class were given an ordinary textual reading on plant location and the class meeting were conducted by asking such questions as, "What are the more important factors in cotton mill location?" it would be possible, at least, to get a discussion started among members of the class, although it must be admitted that the meeting might degenerate into formal routine questioning and answering. If, on the other hand, the class were given a full account of the procedure followed by the Spinwell Company in determining an appropriate location for its new plant, we could readily have a discussion participated in by the students as a result of their analysis of this case material. Case study by students presumes a knowledge at the outset of the main factors to be considered. The questioning on the part of the instructor would almost necessarily go deeper into the matter than routine questioning and answering. The student would be almost certain to carry away a more vivid appreciation of the issues at stake, because in the case method the mind is aroused to activity to piece together related facts in order to find new meaning in them.

A third possible tool of the discussion method is the problem, and this may be of almost any grade of severity and may of course be combined with case material. If, for example, the Spinwell Company case contained an analysis of several possible locations without reaching a conclusion on more than one, the class discussion might well analyze the correctness of this conclusion or might be directed toward listing in order of preference the three most desirable locations, giving reasons for the order chosen. This would probably be a problem of only moderate severity if the case were well written

up. A more severe problem could be set by asking the class to determine whether a certain location, not mentioned in the case, would not have been still better than the one chosen. Now the students must presumably secure new data concerning this new location as their first step in solving the problem. This brings in of course a new opportunity for mental discipline.

As the present book is designed for use in an introductory course surveying the whole field of business administration, it does not include advanced problems. It embodies, none the less, a case and problem approach, and its emphasis is on the case and problem method, although as a transitional collection it has been thought wise to include enough material and questions of the more routine sort to enable the instructor to adapt his teaching method to the stage of maturity and preparation of individual students and classes. The final chapter—in my mind the most interesting bit of teaching method in the book—is a "case" of rather wide reach. It has been my experience that Freshmen can and do handle this case reasonably well at the close of the course: a stimulating hint of the possibilities for more advanced courses.

Perhaps it is worth adding that there is no question that these possibilities can be realized. For more than a decade the group with which I am so fortunate as to be working has been developing a case-and-problem presentation of economics and business subjects. We find the method particularly well adapted to our intermediate and advanced courses, and much of our instruction in these fields is now on the case-and-problem basis. This of course does not mean that the lecture and the textbook do not have an appropriate place in instruction.

It will be noticed that no effort has been made to give exhaustive bibliographies. It has seemed sufficient in an introductory survey, to suggest at the end of each chapter a few references for further study. The most modest library can meet the demand thus made.

It is hardly possible for me to give appropriate recognition of the assistance I have received from many sources during the preparation of this material. It has passed through three mimeographed editions. two pamphlet editions, and a "preliminary" edition to its present form. During this rather lengthy period of preparation criticisms and suggestions have flowed in from almost every member of the group with which I am most closely associated as well as from many other collegiate instructors. My debt to authors and publishers who

have so kindly consented to the use of their material is equally great. I must mention particularly the assistance of Walter Smith, Ruth Reticker, Mildred Janovsky, May Freedman, and Dorothea Schmidt in gathering material and the kindness of Professor C. O. Hardy in preparing the chapter on "The Administration of Risk-Bearing."

A conscientious effort has been made to give credit where credit was due. I am quite certain, however, that many questions have been taken from sources whose origin has been forgotten in the long period of preparation. General acknowledgment of this indebtedness is here given.

L. C. MARSHALL

UNIVERSITY OF CHICAGO
September 1, 1921

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CHAPTER I

THE FIELD OF BUSINESS ADMINISTRATION

Purposes of this chapter:

1. To recall to our minds the main forms of modern economic activity.

2. To secure a bird's-eye view of the tasks of the business administrator.

A study of the business executive is a study of a very important agent in the guidance of our economic activity. For better or for worse, this specialist has come to have a leading part in our modern "co-operation of specialists." It is the purpose of this book to give an introductory view of the tasks falling to his lot and of the methods he uses in accomplishing these tasks.

Beyond question, these tasks and these methods vary from case to case. Modern industry has many forms and the problems of administration certainly are present in very different proportions in our different types of industry. In an introductory survey, however, the similarities rather than the differences may well be emphasized. Therefore, beyond presenting below a diagram designed to recall to our minds the many forms of modern economic activity, the material of this book will be presented on the hypothesis that, for educational purposes, the *functions* of administration are fundamentally the same in all businesses, however greatly the technique may vary. For the sake of having an illustrative case which may be carried throughout the whole discussion, these functions will be considered with particular reference to the work of a manufacturing and selling business.

It is a pity to introduce a discussion of terminology into our work, but the terminology used in this field is by no means standardized. You will frequently find in your readings that a given word is used, even by the same author, in different senses. This may even occur within the limits of a single sentence. It follows that the context must be watched if one is to be clear how certain terms are used. Since the center of our problem is "control of business activities," such terms as "organization" and "administration" come up

very frequently in our discussion. Probably little would be gained by an arbitrary standardization of these terms at this stage of our study. It will suffice for us to bear in mind that "control of business activities" includes three things: (1) the establishment of *policies*, (2) the planning and setting up of the *organization* which is to be used in carrying out those policies, and (3) the *operating* or running of the organization. Organization implies a fairly high order of creative work; that of planning mechanisms, means, and devices to accomplish ends. Operation involves running the mechanisms set up by organization. Administration, if broadly conceived, would include both of these as well as policy formation. So conceived it might be used as synonymous with "control."

THE MANY FORMS OF ECONOMIC ACTIVITY[1]

- Modern Economic Activities
  - Primary Industries
    - Extractive
      - Hunting
      - Fishing
      - Grazing
      - Lumbering
      - Mining
    - Genetic
      - Agriculture
        - Tillage
        - Plant Breeding
      - Forestry
      - Animal Breeding
      - Fish Culture
  - Secondary Industries
    - Manufacturing
    - Transporting
    - Storing
    - Merchandising
  - Personal and Professional Services
    - Healing
    - Teaching
    - Inspiring
    - Governing
    - Amusing, etc.

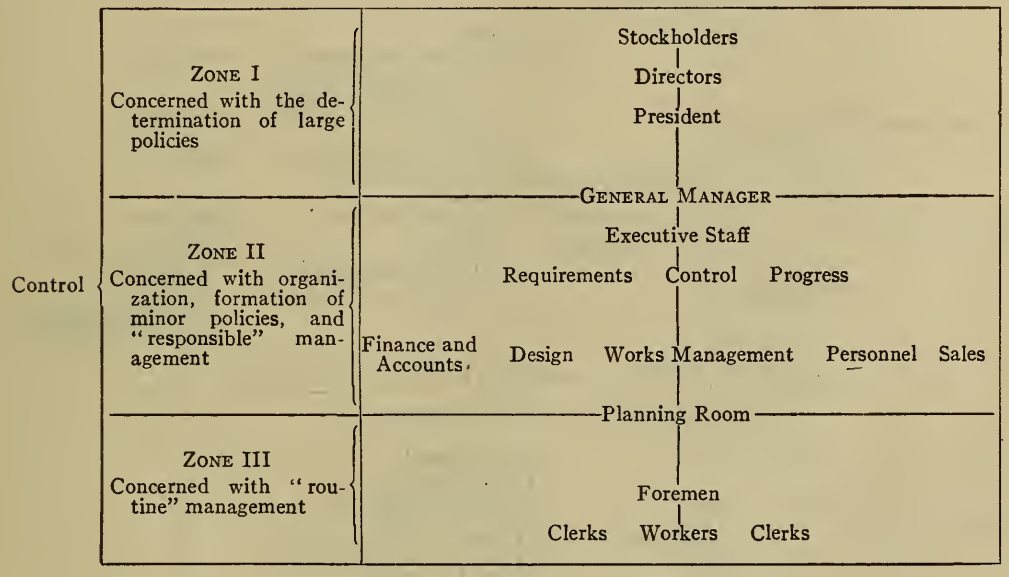
An illustration[2] will perhaps serve to make clear this use of terms. The following skeleton organization chart of a manufacturing business (any other business would have served as well for our purposes) is divided into three broad zones according to the character of the administration which obtains in those levels. Zone I is concerned with policy formation—with the setting of goals in a large way and in general terms. Zone II is concerned with planning and setting up

[1] Taken by permission from T. N. Carver, *Principles of Political Economy*, p. 192. (Ginn and Company, 1919.)

[2] This illustration is taken, with changes in terminology, from a note by H. S. Person in the *Journal of Political Economy*, XXVIII (1920), 110.

an organization to carry out these policies—to arrive at the goals. In this zone minor policies or sub-policies for the various departments are worked out by their chiefs in terms of the major policies of the business. It will be noticed that the general manager occupies a border-line position. He operates in both zones. Zone III is concerned with routine operations containing the veriest modicum of policy formation and very little work that can be called organizing work. From the point of view of control this zone requires only routine management. The planning room occupies the border-line position between this zone and the one above it.

THE ZONES OF BUSINESS CONTROL



Administration, as we are using the term, is concerned with all of these. They are phases of administration. The diagram should not leave, however, an impression that it is possible to draw sharp dividing lines between the various terms we are using. Routine management shades off into responsible management and organization; organization shades off into policy formation; administration includes all of them, its creative work being done in Zones I and II.

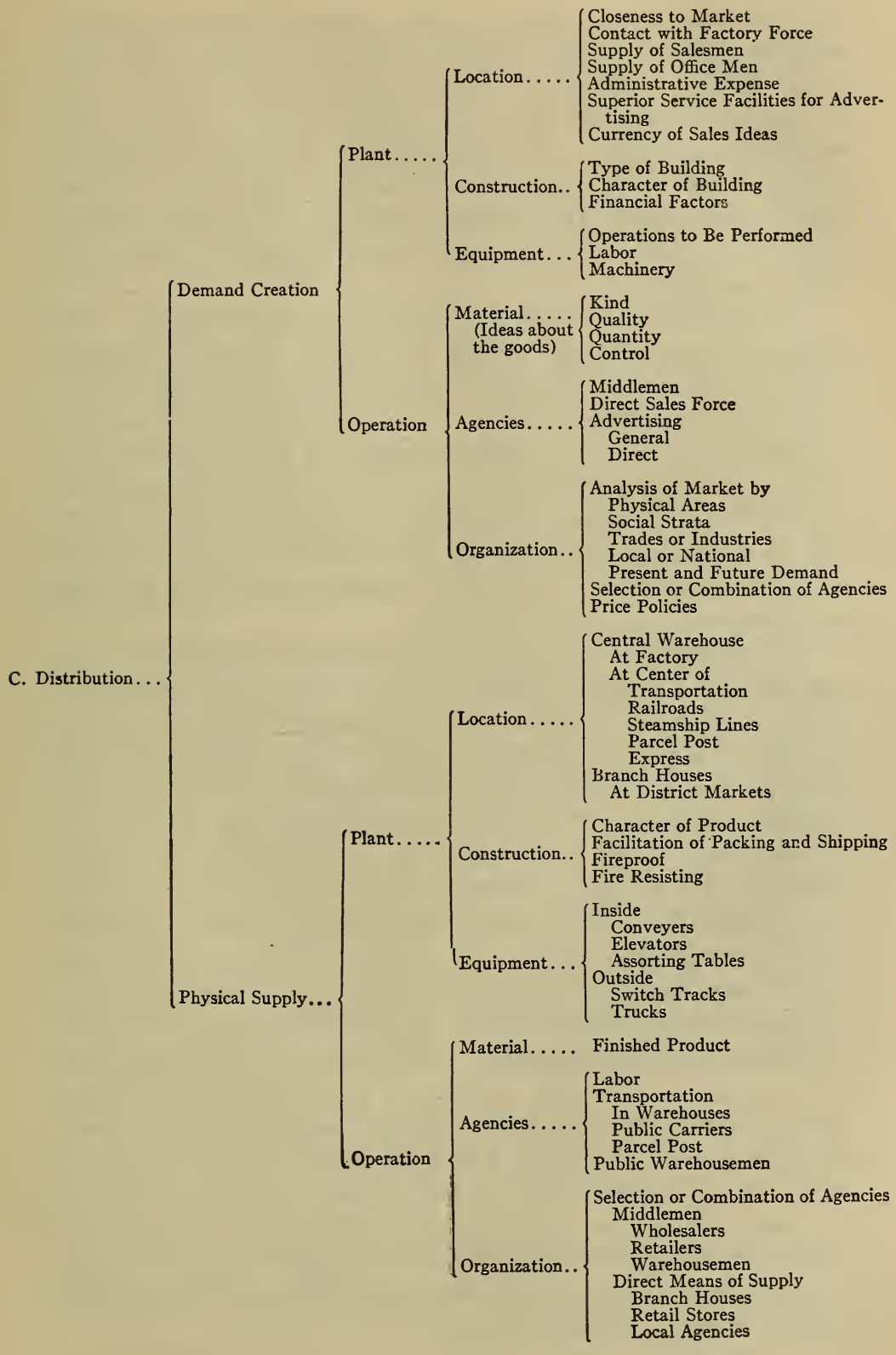
It was said above that our problem is that of understanding the controlling of modern business activities. This certainly involves studying two sets of issues: (*a*) what things are to be controlled, and (*b*) how the control is carried out. In this chapter, we are primarily concerned with getting a bird's-eye view of what matters are to be controlled, and one way of doing this is to formulate a generalized statement of the task of the modern administrator.

I. Descriptively speaking, the task of the business executive extends in two directions. Looking in one direction, he must organize, correlate, apportion, proportion, various elements entering into the *internal operations* of his business. The business world has generalized these operations under such headings as production, distribution, and

A CLASSIFICATION OF BUSINESS ACTIVITIES

(An Abbreviation of a Chart Issued by the A. W. Shaw Company)

- A. Administration
  - Plant
    - Location
    - Construction
    - Equipment
  - Operation
    - Material (Paper representations of activities facilitated)
      - Causal
        - Purchase Requisitions — Purchasing
          - Plant and Equipment
          - Materials and Supplies
        - Employment Requisitions — Employment
          - Labor
        - Shipping Requisitions — Credits
          - Finished Stock
      - Resultant
        - Outgoing Invoices — Collections
        - Vouchers — Finance
        - Records — Recording Division
          - Plant and Equipment — Accounting
          - Material and Supplies — Auditing
          - Labor — Costs Department
          - Statistics Department
    - Agencies — Office Executives and Employees
    - Organization — Office Management
- B. Production
  - Plant
    - Location
      - Labor Supply
      - Raw Materials
      - Nearness to Market
      - Transportation
      - Power
      - Financial Considerations
      - Legal Limitations
      - Advertising Value
      - Physical Site
      - Environment
    - Construction
      - Type of Building
      - Character of Building
      - Financial Considerations
    - Equipment
      - Product to Be Manufactured
      - Labor Available
      - Design of Machinery
      - Financial Considerations
  - Operation
    - Material
      - Kind
      - Quality
      - Control
      - Utilization
    - Labor
      - Hiring
      - Paying
      - Training
      - Handling
    - Organization
      - Types in Use
      - Line or Military
      - Line and Staff
      - Functional


C. Distribution...
Demand Creation
Plant.....
Location.....
Closeness to Market
Contact with Factory Force
Supply of Salesmen
Supply of Office Men
Administrative Expense
Superior Service Facilities for Advertising
Currency of Sales Ideas
Construction..
Type of Building
Character of Building
Financial Factors
Equipment...
Operations to Be Performed
Labor
Machinery
Operation
Material.....
(Ideas about the goods)
Kind
Quality
Quantity
Control
Agencies.....
Middlemen
Direct Sales Force
Advertising
General
Direct
Organization..
Analysis of Market by
Physical Areas
Social Strata
Trades or Industries
Local or National
Present and Future Demand
Selection or Combination of Agencies
Price Policies
Physical Supply...
Plant.....
Location.....
Central Warehouse
At Factory
At Center of
Transportation
Railroads
Steamship Lines
Parcel Post
Express
Branch Houses
At District Markets
Construction..
Character of Product
Facilitation of Packing and Shipping
Fireproof
Fire Resisting
Equipment...
Inside
Conveyers
Elevators
Assorting Tables
Outside
Switch Tracks
Trucks
Operation
Material.....
Finished Product
Agencies.....
Labor
Transportation
In Warehouses
Public Carriers
Parcel Post
Public Warehousemen
Organization..
Selection or Combination of Agencies
Middlemen
Wholesalers
Retailers
Warehousemen
Direct Means of Supply
Branch Houses
Retail Stores
Local Agencies

administration. Some think of these terms as almost mutually exclusive. Others prefer to say that there are two main subdivisions of the internal problems of control, production and distribution, and that administration is a sort of plastic matrix enveloping and determining them both. The relative merits of these two methods of presenting the internal problems of business control are not here under consideration. It is evident that there are such problems. They are so clearly recognized that various schemes of classification can be presented.

But this is not the whole story, perhaps not even half of it. Our business executive must, looking in another direction, organize, correlate, apportion, proportion, various elements entering into the *external operations* of his business. Our individualistic age may not have ready any such comprehensive diagram of these external operations as the business world has drawn of the internal operations, but there can be no question that they exist, and that they are as significant, as pressing, as ramifying, as the internal problems. Courses training to meet them are as truly "business courses" as are those concerned with the internal problems.

A few illustrations may give sharpness to this statement. Suppose that our business executive, viewing the internal problems of control, concludes, and his conclusion is approved by his cost accountant, that it would be profitable for him to use child labor in his factory, or that it would be profitable for him to work all his employees fourteen hours a day. Will he accordingly order these procedures to be carried out? Not if the law of the state in which he operates forbids it and he has reason to think the law will be enforced. Or suppose that his cost accountant demonstrates that it would be profitable to omit certain safety devices. It is clear that the law of the state may be more persuasive than the findings of the cost accountant. Or suppose that his sales manager demonstrates that a certain form of advertising would be profitable. If this form of advertising happens to run counter to the code of ethics of the Associated Advertising Clubs of the World, our business manager may not think it wise to follow the gleam of profits. Examples without number might be cited. It is clear that social control, whether in the form of law, or of a code of ethics, or of public opinion, or of a group of men as represented by an employers' association and perchance by a trade union, may and does largely condition the policies adopted with respect to internal problems of business control.

But these external problems are by no means exclusively problems of social control in the usual sense of the term. The form and structure of the industrial society in which the business exists are matters of vital significance to the executive. The form, structure, and functions of that society's financial institutions will go far to determine policies with respect to financial measures. A relatively narrow range of choices will be vested in the executive. The form, structure, and functions of the commercial organization of that society will practically fix his purchases and sales policies. Technology and the reactions of people under that device known as the wage system will play their part. Thus indefinitely. Over all and through all, environment (external relations), social and physical, will largely determine the range of the activities of the business executive. The scant attention given physical environment in this discussion is in no sense due to any belief that it is unimportant. On the contrary, its importance is so easily recognized that, in the interests of brevity, a more complete treatment of this factor was purposely omitted.

I do not know any satisfactory way of reducing this statement to diagrammatic form. Indeed, it is apparent that the classification "external versus internal problems" is itself crude and even misleading. It is apparent that the figure of speech to the effect that the business executive must accomplish the impossible task of looking simultaneously in two directions breaks down logically quite as much as it does physically. It is seldom true that he can look at internal problems and at external problems as separable issues. These so-called external problems *determine* the so-called internal problems and, possibly to a smaller extent, the internal problems determine the external problems. It is probably near the truth to say that the business executive administers an interacting complex which may, for purposes of discussion, arbitrarily be said to be made up of external and internal problems.

A very useful classification of business activities, drawn apparently primarily from the point of view of the internal problems of control, but with clear recognition of the importance of external problems, is shown on pages 4 and 5.

II. The problem of the business executive may be stated somewhat more analytically. Taking for granted the physical environment, the task of the business executive may be said to be conditioned by four overlapping, interacting determinants (possibly they should be

called variables): (1) technological matters, (2) value and price, (3) social environment, (4) continuous change.

1. The modern business executive has much to do with technological considerations. The development of such sciences as physics, chemistry, psychology, geology, has made available for practical application a great store of knowledge. The Industrial Revolution, the latest and the current chapter in the intervention of capitalism, has placed upon management the responsibility for the conduct of the processes of production in large-scale, group-labor, machine industry. It is no longer humanly possible for the manager to know all the technique of all the processes of production under his supervision. In some cases the doctorate in our modern universities does not give sufficient training to cope with the technological problems even in a small subdivision of a business. But if the manager may not master all the technology involved, he should be intelligent with respect to it, and particularly he must be intelligent with respect to the relationships between processes. We are accordingly justified in regarding technological considerations as one of the main subdivisions of the business manager's problem. The precise form of the technology will vary from business to business, and from one aspect to another of a given business. The general statement may be made, however, that the manager of a "manufacturing and selling" business will continually come into contact with technological problems, the proper administration of which will require training in such fields as physics, chemistry, geology, psychology, and the biological sciences, the field varying with varying circumstances.

As one illustration of the presence of technological considerations, observe the mechanical problem in the producing end of a machine-shop. Let the trustees of some great endowment go to the production manager with this proposal: "We intend to free you from everything except technical problems. Disregard price and financial policy entirely. Take any grade or grades of land, take any grade or grades of labor, take any of the present forms of capital goods, and take any or all of these in any quantity you choose. Work out for us the best technical combinations." The problem would be a formidable, even a staggering, one, able as the production manager would be to summon to his aid the fruits of generations of development in mechanical engineering. Years of patient research would be required. Similar problems having their bases in technological considerations other than those of mechanics will occur to everyone. Every manu-

facturing business finds them looming large, and probably no business is free from them.

2. Baffling as are the technological aspects of the business man's problem, they are after all but the beginning of his difficulties. These technological difficulties are all shot through and through with variables of value and price. Our business manager may not take any grade of land in any quantity he chooses; he may not select any grade of labor in any quantity he chooses; he may not utilize any existing form of capital goods in any quantity he chooses. In every case *price* enters, and he must ask himself such questions as these: Will this grade of land for which I must pay x dollars be better for me than that grade of land for which I must pay y dollars? Shall I use this grade of labor at this given price, or would it be better for me to use another grade of labor at a different price? Shall I use this particular machine at this price, or shall I use one of the scores of other machines which will be furnished me at different prices? And granted he has reached some solution of these questions, he knows that price is again the significant consideration in the disposal of his product. In all of these price intricacies the business man is largely the victim of circumstances. Unless he has monopoly power, he has as an individual very little to say concerning the price at which he may secure any factor of production, and still less to say concerning the price at which he may dispose of his product. In the pecuniary aspects of his problem he is grappling with forces which he must understand if possible, but which he can do little to control.

3. Still further complicating the business manager's technological problems, shot through and through as they are with the variables of price, is the factor—variable—social environment. The modern business manager is not conducting his business up in thin air, nor is he located on a desert island. He is in the midst of organized society, and his operations are subject—more than he is likely to realize in our individualistic régime—to what we have come to call social control, both formal and informal, both conscious and unconscious. Quite aside from social control in the ordinary sense, the organization of society, with its whole psychological and institutional background, lays down limits to his freedom of operation. But this has already been sufficiently discussed for our present purposes.

4. And there is a fourth factor, or variable or characteristic aspect, of all the foregoing factors—continuous change, the influence of progress—and this crisscrosses all the other factors. There are

changes in technique, some of which may result from an intensive study of his own business and some of which may be forced upon him, in this pecuniary, gain-organized, competitive business world, by outside inventions. The methods of production or of marketing may be revolutionized within a few years. There are changes in the price factor, some brought about by his own action, some brought about by the action of competitors, some forced upon both him and his competitors by happenings that to the lay mind have no conceivable bearing upon the business concerned. There are changes in the social environment, and these are typically little under his control. Indeed, in general terms, the individual will have little influence in determining any or all of these possible changes. None the less, the slightest misjudgment of the actual course of events often means for the business but one outcome, failure. Woe to the business executive whose training gives him a static conception of business problems!

One interested in training for business administration may well turn aside, at this point, to reflect that he has a key to the understanding of much current gossip concerning such training. Some gossips urge as the best business training a good engineering course. It is clear that this is a helpful suggestion, for such a course would assist greatly in solving technological problems. Others urge work in economics, law, and the other social sciences. This suggestion certainly has merit. Following it would result in a knowledge of social control, social environment, and the laws of price. The study of history, presumably, or of some evolutionary science, would aid in preparing the future manager to meet the problems resulting from progress. These suggestions are all valuable, no doubt, but they are piecemeal suggestions. Training for business administration demands more than any (or all) of them provides.

III. Perhaps what is involved in training for business administration may be seen with some sense of proportion if one states the tasks of the business executive *in terms of the functions he performs*. Summarily stated, the outstanding tasks of the executive are concerned with the following:

1. His relationship to the physical environment
2. His relationship to technology
3. His relationship to the market
4. His relationship to personnel
5. His relationship to finance

6. His relationship to risk and risk-bearing

7. His relationship to the social environment

8. His relationship to the coherent control of activities arising from the foregoing relationships.

1. With respect to his relationship to his physical environment little need be said. This relationship is always present but it is of course more obvious in the primary industries (see p. 2) than in the secondary industries or in professional and personal services. In this relationship the manager comes into touch primarily with the problems of the earth sciences. He may or may not be an expert in these fields; the typical manager has only a general acquaintance with them. He relies upon the expert opinion of the geologist and the geographer. These experts are in some cases permanently attached to the business; in other cases they are merely called upon in connection with some specific task.

2. Quite commonly we hear modern industry called "technological" industry. One writer[1] states it a bit differently by reminding us that the economic activity of man has passed through three stages. There was first the appropriative period in which man "appropriated" commodities in their natural state. For example, he picked and ate berries or nuts. Later came the adaptive period which may be illustrated by the assembling of branches or stones to build a hut. He is today in the creative period in which science is the handmaiden of industry, and in which startling analyses and metamorphoses of commodities take place.

With the development of our society a rich institutional life has sprung up in connection with the technological aspects of industry. The clearest illustration of this may be seen in the development of our schools of technology. The Industrial Revolution, notwithstanding the great increase of productive power which it gave us, ushered in an era during which the expansion of the market occurred even more rapidly. The need of the times was a steadily increasing productive capacity and the response was, in part, our schools of technology which applied the findings of science to agriculture, mechanics, mining, and other fields.

The modern executive must operate in terms of this situation. As has been indicated above, he must, at the very least, be intelligent with respect to the technological aspects and implications of his task.

[1] Cf. Slosson, *Creative Chemistry.*

3. Our whole industrial society is in a sense a market society. A loan at a bank, the hiring of a worker at a factory, the ordering of a meal at a restaurant, the issuance of stocks and bonds of a corporation, the lease or purchase of a piece of land, the payment of tuition at a university—indeed, the major part of the business happenings of our daily life—are either market transactions or closely allied thereto. In making this statement, however, the term "market" is used in its broadest inclusive sense. The executive thinks of it in a narrower sense. To him it is the institution and procedure through which he secures his equipment and raw materials and through which he disposes of his finished product.

Here, too, an interesting range of institutional life has developed—again partly in response to the needs of the executive. The wholesaler, the retailer, the jobber, the advertising agency, the mail-order house, the transportation systems, are some of the more common forms. The modern business executive deals with his market problems in terms of this institutional life round about him. If he has sufficient daring, initiative, and power, he will modify it to some extent. He may even start some new form of it. The typical executive, however, operates in terms of the institutional environment as it is. His purchasing agent and his sales agent utilize rather than modify the tools they find ready to use.

4. The influence of social organization is quite as strikingly seen in the case of the executive's relation to the problems of personnel. Indeed, it is not too much to say that his personnel manager, or industrial-relations manager, or employment manager, or whatever he may be called, must operate not only in terms of the existing social organization but in terms of the historical development of that organization. Only as a result of an awareness of the development of industrial relationships—at least during the last two hundred years—can the personnel manager cope satisfactorily with the modern problems connected with incentive and output. His administration of hiring, discharge, promotion, discipline, safety, health, sanitation, welfare, collective bargaining, wage rates, and all the other difficult tasks in personnel administration must be in terms of the laws, habits, social attitudes, and institutional life governing this field. Here also opportunity exists for initiative, exploration, and discovery. But the typical manager is likely to use rather than modify in any significant way the instruments already in existence.

5. The case is not different with respect to the financial function and the administration of finance. Through several centuries devices

and institutions have been developing in this field. Stocks, bonds, promissory notes, investment banks, commercial banks, savings banks, insurance companies, the Federal Reserve System, Dun's, Bradstreet's, collection agencies, credit men's associations, the corporation itself, form the merest beginning of the list of such devices and institutions. The financial affairs of any business, manufacturing or commercial, large scale or small scale, are administered in terms of the financial organization of society. The range of choices open to the manager is relatively limited.

6. Similarly also in the case of risk and risk-bearing. Modern industrial society is in its very nature a speculative society, the term being used with no opprobrium. The modern manager incurs risk in various forms resulting from almost innumerable causes. He meets these risks by means of institutions and devices. Of these the insurance company, of which there are dozens of forms, is the one more generally known. It is not, however, as important as is the speculative contract in its multitudinous forms. Any contractor who lets out, at fixed prices, sub-contracts in subordinate operations is relieving himself from the risk of price changes in these fields and such actions are multitudinous. Then, too, one must not overlook inquiry, research, and the growth of knowledge as factors in risk reduction. An outstanding fact with respect to the development of knowledge is the removal of business happenings from the realm of the unknown to the realm of the non-speculatively known. Herein, in part, lies the explanation of the recent movement for the establishment of bureaus of research in business houses. Herein, in part, lies the significance of knowledge as an economic function.

7. The manager's relation to social control has already been discussed in part. The institutional life connected with the functions enumerated above are forms or agencies of social control. The very fact that the manager operates in terms of this institutional life shows the extent to which he is subject to social control. If to this institutional life we add the forces of competition, private property, habit, custom, group psychology, public opinion, and finally of organized law, both written and unwritten, we have a social environment which envelops the manager's operations in as definite and influential a way as does his physical environment.

8. We come, finally, to his relation to the coherent, balanced, control of the various activities of his business. Here several outstanding matters strike one's attention. In the first place, he will administer the various problems of his business in terms of some

established policy. This policy, the manager, influenced by his social surroundings and by his own individual attitudes and experiences, and by the owners if he is not himself the owner, must work out. In the second place, even a small business can be well conducted only in terms of a well-formulated organization. Various schemes of organization have been developed to meet varying needs in this respect. In the third place, modern business has become so large and so complex that measuring aids have been developed to give the manager more complete grasp of the control of his problems. Some of the best known of these are financial accounting, cost accounting, time study, mental testing, material testing, and specifications.

Let us return to our discussion of curricula designed to train for business administration. If the foregoing analysis of the tasks of the executive is accepted, the planning of the curriculum would presumably proceed along the following lines. The business executive administers his business under conditions imposed by his environment, both physical and social. The student should accordingly have an understanding of the physical environment. This justifies attention to the earth sciences. He should also have an understanding of the social environment and must accordingly give attention to civics, law, economics, social psychology, and other branches of the social sciences. A knowledge of environment is not sufficient, however. It must be supplemented with a range of courses dealing with business management wherein the student may become acquainted with such matters as the measuring aids of control; the communicating aids of control; organization policies and methods; the manager's relation to production, to labor, to finance, to technology, to risk-bearing, to the market, to social control, etc. Business is, after all, merely an organized scheme of gratifying human wants, and, properly understood, falls little short of being as broad, as inclusive, as life itself in its motives, aspirations, and social obligations. It falls little short of being as broad as all science in its technique. Training for the task of the business manager must have breadth and depth comparable with those of the task.

Stating the matter in another way, the modern business administrator is essentially a solver of business problems—problems of business policy, of organization, and of operation. These problems, great in number and broad in scope, divide themselves into certain type groups, and in each type group there are certain classes of obstacles to be overcome, as well as certain aids, or materials of solution.

If these problems are grouped (1) to show the significance of the organizing and administrative activities of the modern responsible manager, and (2) to indicate appropriate fields of training, the following diagram results:

DIAGRAM OF OUTSTANDING RELATIONSHIPS AND FIELDS OF TRAINING

Control
1. Communicating Aids of Control, for example
   a) English
   b) Foreign Language
2. Measuring Aids of Control, for example
   a) Mathematics
   b) Statistics and Accounting
   c) Psychology
3. Standards and Practices of Control

Of Problems of Adjustment to Physical Environment
Appropriate Fields of Training
a) The Earth Sciences
b) The Manager's Relationship to These

Of Problems of Technology
Appropriate Fields of Training
a) Physics through Mechanics, Basic, Other Sciences as Appropriate
b) The Manager's Administration of Production

Of Problems of Finance
Appropriate Fields of Training
a) The Financial Organization of Society
b) The Manager's Administration of Finance

Of Problems Connected with the Market
Appropriate Fields of Training
a) Market Functions and Market Structures
b) The Manager's Administration of Marketing (Including Purchasing and Traffic)

Of Problems of Risk and Risk-Bearing
Appropriate Fields of Training
a) The Risk Aspects of Modern Industrial Society
b) The Manager's Administration of Risk-Bearing

Of Problems of Personnel
Appropriate Fields of Training
a) The Position of the Worker in Modern Industrial Society
b) The Manager's Administration of Personnel

Of Problems of Adjustment to Social Environment
Appropriate Fields of Training
a) Historical Background
b) Socio-economic Institutional Life
c) Business Law and Government

It will help us to understand modern business administration if we think of it as one means or method of co-ordinating modern specialists. That it is such a means may be seen more clearly if we use historical perspective.

The manager of the medieval shop may be called the undifferentiated or unspecialized manager. In one person, the master craftsman, was vested control of all the relationships of the business. He, practically unaided, not merely supervised but actually conducted production, purchasing, selling, risk-taking, and all other managerial functions. Nor was this a difficult task. Men worked together quite simply in the shop of the medieval craftsman. To begin with, it was tool industry, and the simple technological processes involved were readily mastered. Anyone of average intelligence could, so far as the technology was concerned, become a competent workman and later rise to the direction of industry. Then, too, production was on a very small scale, being conducted by the craftsman in his own home with, perhaps, two or three helpers, who might well live in the home of the master. The relationships between the craftsman and his helpers were frequently almost as personal as modern relationships between father and son. Thus, both the character of the processes, the scale of operations, and the human relationships made it a simple matter to control production in the medieval shop.

If the organization within the shop was simple, so also was the co-ordination of the shop with the rest of society. The market for which the shop produced was typically local and personal. Sometimes the customer came to the shop and goods were made according to personal desires; sometimes the craftsman carried his goods to the little town market and sold them to his neighbors; seldom was the relationship between producer and consumer an impersonal one; seldom were there intermediaries who had to be knitted into an economic organization. Simple also was the social supervision of industrial activity. Social attitudes, church requirements, and governmental regulations were fixed largely by custom. Men absorbed this customary control in the very air they breathed. They did not have to study it. It became a part of them without their being conscious of it. We must not deceive ourselves concerning the implications of this simplicity. Life was meager, narrow, and mean. None of us would wish to return to such a life. We have examined it merely to see how simply and in what a personal way men worked together. Undifferentiated management sufficed in such a situation.

Into this simple industrial society there gradually crept forces making quietly but radically for change. The compass, gunpowder, the printing-press, explorations and discoveries, colonization, the religious reformation, the new birth of art, literature, and science, the growth of individualism, the rise of strong central governments—these are some of the outstanding forces which freed men's minds from customary control, developed the gain spirit, widened the market, increased specialization, and paved the way for more complex forms of working together. Generation after generation the change continued, and finally there came in the eighteenth century that great explosion which we now call the Industrial Revolution. It blew to fragments the simple, personal co-operation of the past. This statement of fact is also one statement of the problem confronting modern management. The simple, direct ways of working together have been blown to fragments. Can any of the fragments be restored? What new *ways of getting men to work together* can be found which will be more in keeping with our modern complex, specialized, impersonal, interdependent, gain-organized society?

Fundamentally, the problem of working together today is one of knitting together the specialists and specialized institutions of modern society. In the interests of increased productive capacity, we have specialized our capital, our technological processes, our workers, our knowledge, our management, our producing territories—everything. In the case of the workers, this has meant that the *non-specialized worker* of earlier ages has become the worker in a single *trade* or *occupation*, as, for example, the lawyer, the physician, or the all-round mechanic; and these, in their turn, have been split up into workers who concern themselves with only one *process* of a trade or occupation, as, for example, the diagnostician, or the ordinary machinist; and these process specialists have, in their turn (provided the market has been wide enough to make it profitable), been split up into workers in *detailed operations*, such as the modern narrow machine specialist. Now, these thousands upon thousands of specialists must be knitted together into a great producing mechanism, if society is to gratify its wants and secure all those intangibles making for human progress. So also must the specialized capital, knowledge, and management be knitted together.

All this is easily seen in the case of the operations within a plant. A child can see that the specialized workers, capital, and processes within a shoe factory must be organized into a producing mechanism

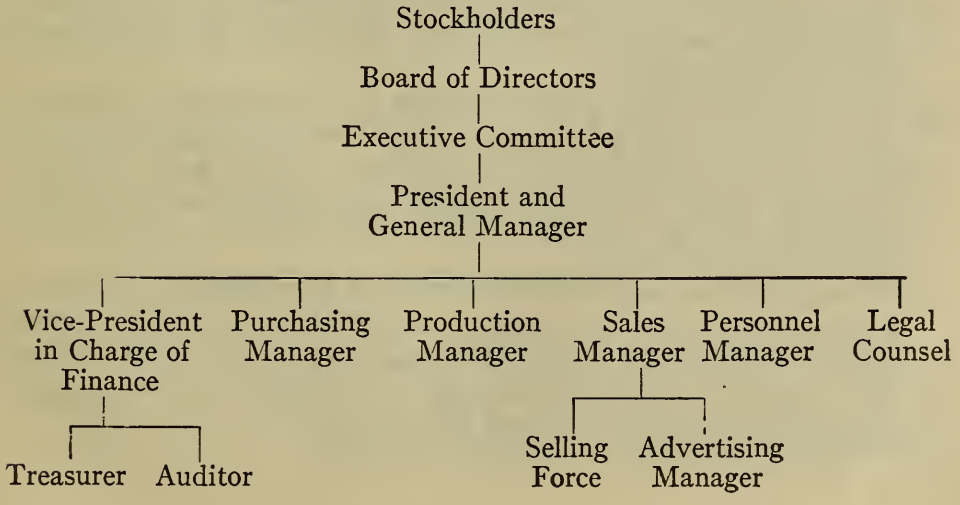
before shoes can be made. A child can visualize some of the tasks of the manager and his lieutenants in this connection. It is not so easy, however, to visualize the knitting together of the thousands of specialized *plants* and *institutions* of our society into a great, producing machine which takes in all society. As one method of visualizing this process, notice a few of the specialized plants which must be lined up to provide us with shoes. Beginning with the ranch (and not going back to the specialists who have provided the ranch with equipment), we can mention at once the packing house, the tannery, the leather merchants, the shoe factory, the wholesaler, and the retailer. Here is a range of specialized institutions lined up to accomplish one task. But some of the specialists in this range, for example the packing house and the tannery, are participating simultaneously in dozens of other ranges designed to accomplish dozens of other tasks. Modern industrial society is therefore a bewildering complex, a literal maze of crisscrossing, interacting ranges of specialized plants, filled with specialized workers, machines, and processes, reaching out to accomplish thousands of purposes. And this is but the beginning. All these ranges are crisscrossed and served by still other ranges of specialized functional middlemen like carriers, bankers, insurance companies, or advertising agencies. All must, through social control and through the market, be welded into a balanced, want-gratifying machine, and woe is all society if the welding is seriously defective!

In this there is nothing new. It is set forth merely to recall to our minds the conditions under which the modern manager and such lieutenants as the personnel manager, the sales manager, and the purchasing agent do their work. Whether wisely or unwisely it matters little for the present discussion, society in its desire for product has intrusted the task of organizing for production to the entrepreneur, who may or may not be his own general manager, and the work of any of his lieutenants can be seen in true perspective only when this fact has been realized. Crudely stated, it is as though society had said to modern management: "Modern specialists must be brought to work together. For part of this task, various groups, including that large group called the state, will be responsible. They will work through the agencies of social control and will powerfully affect apportionment of productive energy, controlling indeed your own operations in the tasks assigned to you. For part of the work you will be responsible and your agencies are mainly two, (1) authority and (2) the market. These are not separate and distinct. Your

authority will come to you mainly through the market. Through your control of property rights you may, *by market operations*, get command of land, labor, and capital, and these you may control *by authority* within your business unit. The co-ordination of your unit with the rest of society will be worked out through the market. You will come into contact with the market through your sales and purchases."

As time has gone on, it has become clear that management itself must specialize if such burdens are to be carried. An authentic history of the differentiation of management has never been written. We know, however, that as the market widened, there sprang up functional middlemen, such as carriers, insurance companies, and banks, who (for a price) relieved the manager of some of his operations in such fields. We know also that, within his own organization, he began to use deputies or agents, such as the supercargo, the branch house, or the agent proper, in various managerial operations. As time went on, there came about such an increase in size of the business unit that the volume of "control work" reached the stage where men specialized in certain aspects of controlling and, to come down suddenly to recent times, we find in a modern manufacturing business such functionaries as the production manager, the purchasing agent, the sales manager, the treasurer, the advertising manager, the personnel manager, and the auditor. These are, of course, subordinate to the general manager, who may or may not be the owner of the business. He, more than any other functionary, holds a position kindred to that of the medieval craftsman—kindred, but very different indeed.

POSSIBLE ORGANIZATION CHART OF A MANUFACTURING AND SELLING BUSINESS



PROBLEMS

1. Notice again the classification of industries on page 2. Why not train for business management by studying the management policies and methods of several firms from each type of industry?
2. State in a few words the "problem" of business administration. Is it different from the problem of school administration or governmental administration?
3. Just what is Shaw's classification of business activities (pp. 4, 5) designed to accomplish? Is it a diagram of the proper organization of a business? Is it a diagram of the various operations of business? Is it a diagram showing how to locate the incidence of a given business problem? To what type of business does it refer?
4. Are the "external problems" of the manager more difficult today than they were in 1300? Go into details in your answer.
5. What do you, as a manager, need to know about public opinion? about government? about developing codes of ethics?
6. What does "business law" include? Show why (or why not) the manager needs to have a knowledge of it.
7. "No intra-organization policy can safely be determined without taking into account the attitude of society toward the activities involved." Explain. Cite instances or cases.
8. Show by specific instances how the government controls the business man in his relations with (*a*) other organizations; *b*) his employees; (*c*) his customers.
9. "The problem of the business manager is to sense public opinion and take steps to follow it before it is expressed in actual regulation." Is this true? Should he always follow public opinion? May he aid in forming public opinion?
10. How would you convince a modern business man that public opinion affects him quite as much as governmental laws and regulations?
11. What advantages do you see in classifying the problems of the manager into external and internal problems? What are the disadvantages of such a classification?
12. "The function of the general manager is to co-ordinate and direct production, distribution, and facilitation." "His function is to organize and administer his business in terms of its relationships to finance, personnel, market, risk, social control, and technology." With which quotation do you agree?
13. "The business manager's administration of his business is in terms of his physical and social environment and is conditioned by these environments." Does this seem to you to be substantially true? Give evidence.
14. How should you go about securing a knowledge of the manager's physical environment? the social environment?

15. It is said that one of the manager's functions is concerned with his relations to technology. Cite as many instances as you can of the manager's need of understanding technological considerations in a mail-order business; in a retail store; in a bond house; in a bank; in a tannery.
16. The manager of a very complex machine shop, himself a competent mechanical engineer, says that his technological ability represents not more than 15 per cent of his necessary equipment for management. If so, how is the other 85 per cent made up?
17. What is meant by saying that with respect to the price situation the business man is largely the victim of circumstances; that he is grappling with forces which he must understand if possible, but which he can do little to control?
18. "Woe to the business manager whose training gives him a static conception of business problems." Why or why not?
19. Why has accounting gained such an important position in the field of business? Of what value is it to the business executive? Of what value is economics? psychology?
20. "Civilization is passing out of a period of traditional knowledge into one of scientific knowledge." As a means of clarifying your mind on this issue, try to estimate what percentage of business activities of today are ruled by tradition and what percentage by science. Does the percentage vary from industry to industry, from plant to plant, from place to place?
21. "Business has long been hampered by tradition." Can you cite instances? What advantages flow from the presence of tradition in business?
22. It is often said that a man will be more successful if he starts working from the bottom of the business, and then gradually advances; in this way knowing every detail of the business he may come to manage. What are the arguments for and against such a method?
23. "The manager should be able to inform his staff on any problems with which they have to deal." Is this true? Should a manager know as much of accounting as his accountant and as much of packing methods as his shipping clerks? Can a manager of a manufacturing department run his department successfully if he is not familiar with the processes or operations that go into his product? If he has to depend on his subordinates for information will he succeed? What is your tentative conclusion concerning the qualities, training, and experience essential to successful management?
24. "An idea which is a great stumbling-block is the one that one of the fundamental divisions of a business is superior or inferior to another. Unless a logical and true balance is preserved, the development of the business will be one-sided, resulting in a mal-administration. Many

businesses are less successful than they might have been because the manager has gained his experience largely in one or two divisions." Can a man get experience in all divisions? If not, is there any hope?

25. The earlier "captains of industry" and even many of those of today are certainly not conscious of any such analysis of their problem as is sketched in this chapter. Does this mean that the analysis is useless?
26. Assume some (different) problem in each of these fields: (1) technology, (2) finance, (3) personnel, (4) marketing. Now show the interdependence of business problems by tracing the consequences of each of these problems in each of the other fields.
27. "The talk of scientific management makes me weary. I have never read any of the stuff and yet my business is managed in scientific way. It is the result of years of study in which careful attention has been given to the best traditions in business. After all, the best proof that it is a scientifically managed business is to be found in the facts that it has grown from small beginnings to its present size; it has consistently paid dividends; it has accumulated a surplus; it has its stock regarded as one of the safest of investments." Reason with the writer.
28. Why should social reformers and persons interested in establishing a new order of industrial society understand the problems of the business manager?
29. Consider the following facts:
    a) It is exceptional for a student to know before graduation what line of work or vocation he will enter.
    b) Most students go into the line of work which seems to present the best opportunities.
    c) Five years after graduation the student is usually not in the line of work in which he started.

    On the basis of these facts, tell what you think should be the outstanding features of a college course designed to train for business administration.
30. Draw up an outline of the main points in this chapter.

REFERENCES FOR FURTHER STUDY

Jones, *The Administration of Industrial Enterprises*, chaps. 1, 7.
Shaw, *An Approach to Business Problems*, chaps. 1. 2, 19.

CHAPTER II

A SAMPLE BUSINESS PROBLEM—PLANT LOCATION

Purposes of this chapter:

1. **To prepare for the later discussion of the tasks of the manager**
   - (*a*) **by convincing ourselves that the relationships sketched on page 15 are real and vital.**
   - (*b*) **by becoming accustomed to thinking of these relationships as highly interdependent.**
2. **Quite incidentally, to secure an elementary knowledge of the factors determining an appropriate location for a business unit.**

In a book committed to the discussion of business administration in terms of the outstanding relationship of the manager, it is something of a digression to study a sample business problem before we have studied those relationships. The digression is, however, justifiable. We shall be more willing to undertake a somewhat detailed study of the various relationships of the manager sketched in the preceding chapter if the examination of some business problem discloses the fact that those relationships really are present. Then, too, examination of a problem will show that these relationships are quite interdependent. They are not separate, distinct, and individual. Our later detailed study of each of them will be far more profitable if their interdependence is always in the background of our thinking.

The classification of economic activities on page 2 shows that there are many types of plants which are to be located. It will suffice for our purposes if we consider very briefly the case of the primary industries and then in more detail the location of manufacturing, marketing, and financial plants.

A. Conditions Determining Location in Terms of Broad Areas—Territorial Specialization

First of all let us notice, for these industries, the general conditions which determine in what *broad* belts, areas, or zones (as

contrasted with *site* location) such business units are likely to be found. Obviously enough, this really becomes a discussion of geographical or territorial specialization. Selections 1 to 12, together with your general information and with general reasoning will serve as a basis of discussion of the following:

PROBLEMS

I. *With particular reference to primary industries:*

1. "The primary industries cannot be separated from the natural resources upon which they depend." Is this true? What light does it throw upon the location of primary industries? on the relation of the manager to physical environment?
2. It has been said that climate determines the broad zone and that geographical and geological conditions determine what shall be the location within the zone of all primary industries dependent upon flora and fauna. Cite illustrations.
3. Cite primary industries not primarily dependent upon flora and fauna. Does the statement of the preceding question apply to such industries?
4. What is meant by the statement "extractive and elaborative industries are linked together by technical as well as economic bonds"?
5. What is the central thought of the preceding questions?

II. *With particular reference to manufacturing industries:*

1. In what types of manufacturing industries does accessibility to raw materials involve proximity to them?
2. "An assembling industry sometimes has as its raw material, the finished products of other plants." What light does this throw on problems of location of assembling industries?
3. "In manufacturing paving brick it has been estimated that the relative weights of clay, finished product, and coal required are approximately 40, 30, and 3." Do these facts throw light on the question of location? Do they answer the question?
4. "As far as materials are concerned, the test of a good location is not the cost of materials laid down, but the material cost of a unit of completed product." Explain, bearing in mind such factors as original purchase price, converting expense, labor expense, overhead, transportation cost, buying expense, reliability of supply, and expense of reserve necessary. Do some of these go beyond the range of the quotation?
5. "If a plant grows so that its supplies and products demand large facilities for handling, and its consuming public is national or world-wide, then the question of markets is one of accessibility and not one of proximity." Explain. Are there such cases?

6. In what cases does accessibility to markets typically involve proximity to markets?
7. Does whirlwind advertising, a trade-mark, and a good product free an industry from other location problems?
8. "Industries engaged in producing valuable, durable, material objects in wide demand are likely to have their plants concentrated in only a few localities; those engaged in producing bulky, or perishable, or non-material goods, or goods in narrow demand, are likely not to be thus localized." Do you agree? Can you cite instances?
9. "The most important consideration in the selection of manufacturing sites is that of transport facilities." "Transportation which so often comes to a person's mind as a factor in industrial plant location is really of secondary importance. Transportation will develop when and where the goods demand it." Which quotation is correct? Why?
10. "The location of a lace factory is not of importance because the transportation of raw materials and finished product is so small a proportion of the value of the product as to be negligible." Do you agree?
11. Explain how, from the point of lower freight rates and of lessened risk, it may be worth while to scatter the various plants of a concern over the country. Will this always be true or is it true only of certain types of industries?
12. "Water transportation is advantageous when it connects the plant with important sources of raw material or a good sales market." Would good water transportation be important to an industry which never made use of it?
13. "The strategic places for industries which involve important assembling and distributing functions are (*a*) points on competing waterways, (*b*) centers at which numerous competing railways converge, (*c*) locations within influential commonpoint territory adjacent to the previously mentioned centers, and (*d*) localities so influential in the supply of certain products as to enjoy favorable commodity rates on these articles." Explain. Cite several instances of each case.
14. Are transportation matters primarily connected with physical environment, or with social environment, or with market relationships, or with some other item in the diagram on page 15?

15. Are manufacturing industries today as dependent upon proximity to sources of power as they were one hundred years ago? Explain in detail.
16. What industries need to be located so that they have accessibility to fuel supply? What industries need to have this accessibility involve proximity?

17. "Capital is scarcely worthy of discussion as a locating factor because of its great mobility." Is this true? What would be the case if it were a problem of re-location rather than one of location?

18. "Mere numbers of people do not necessarily make a suitable labor environment, and a good labor situation for one industry may be a poor one for another." Explain.
19. What is meant by locating "so as to reap the advantages of being a 'parasitic industry' as regards labor supply?" Do you know of any such cases? Is such a proposition socially desirable? Suppose the term used had been "complementary industry," what answers should you make?
20. "Speaking generally, satisfactory labor power will be found in a dense population." What are the elements of a satisfactory labor power? Is it true that they are generally found in a dense population?
21. "Concentration of establishments even of a like kind and direct competitors, improves the labor market, both for employer and employee, in many ways." Explain.
22. "Labor is not sharply localized—like fuel and materials it may be transported, its prices in different markets tend to converge." Do you agree? Why or why not?

23. What is meant by industrial imitation with respect to plant location?
24. "A range of special services and special facilities tends to develop around industries which are once established." Name and explain these special services and facilities. Does the quotation mean that it is a matter of indifference where the original settlement is made?
25. Draw up a list of the reasons why industries mutually attract one another. Is it true of like industries? of unlike industries?
26. "The trend of manufacturing, geographically, is, therefore, an important factor in locating an industry and is worthy of careful consideration in locating a new plant or moving an old one." Why or why not?
27. "New England furnishes an interesting illustration of how the momentum of an early start may offset other factors connected with plant location." Explain. Do you agree?
28. "Governments have sometimes made and unmade industrial locations." State how that is possible.

29. If you wished to locate a manufacturing plant and you had to choose among three places, equal in all respects, except that one had a poor labor market, another, inadequate supply of capital; and the third, poor transportation, which one should you choose?
30. Arrange in order of importance the following factors: (*a*) proximity to raw materials, (*b*) cost of transportation to market, (*c*) cost of land, (*d*) presence of cheap power, (*e*) supply of suitable labor, in each of the following cases: (1) electric smelting, (2) the manufacture of jewelry, (3) the manufacture of tile, (4) the manufacture of cotton cloth, (5) a canning industry. In cases where you are unable to make the ranking requested, wherein does your inability rest?

31. Notice the table showing the concentration of certain industries. What types of industries are centralized in New York? in Pennsylvania? Account for the centralization.
32. The manufacturers of the United States are largely concentrated in the northern and eastern parts of the country. Account for this concentration.
33. I am thinking of starting a cotton-spinning mill in the Chicago district. What factors should I have in mind?
34. Notice the reading on the location of the cotton-manufacturing industry. Make a list of the lessons which you draw from that reading. Is the diagram on page 15 helpful?
35. Think back over the preceding questions to determine whether there have been raised issues concerning the manager's relation to physical environment; social environment; personnel; markets; finance; risk-bearing.
36. What cases have you seen in the study thus far of the interdependence of these relationships? For example, were there any market relationships which involved financial considerations?
37. Draw up an outline of the main points in this section.

III. *With particular reference to marketing and financial industries:*

1. Why are distributing centers typically on some transportation route? "The cities that form the best sales markets are those where trade routes meet or toward which they converge." Why? Give instances.
2. "Another class of cities forming good markets is found in cities which are collecting and distributing points in an exceedingly productive area." Cite instances.
3. What is the entrepôt? Is it a result of historical accident or of economic causes? If the latter, what are the causes? Are its days numbered?
4. What is the distinction between "transaction or bargaining center," and "distributing center"? Cite instances where a transaction center need not be a distributing center. Convert these instances into generalization. Has the question any bearing on the problem of business location?
5. What forces cause a transaction center to emerge?
6. "Trade in manufactured goods continues to cling to the older distributing centers and devious routings long after it is possible to make direct shipments." Why?
7. You are to engage in a business dealing in ungraded goods. What does this mean with respect to location?
8. Shaw in his *Approach to Business Problems* speaks of the distributing problem as being made up of (*a*) demand creation, and (*b*) physical supplying of the goods. He says, "There are five simple solutions

of the problem of location of the plant for demand creation: (1) The sales plant may be at the factory; (2) at the largest neighboring city; (3) at the largest trade market; (4) at the chief city of the county; (5) a central sales plant at one of these locations with auxiliary or branch organizations." Cite some of the advantages of each solution.

9. Notice the reading on the location of the wholesale dry goods business. What lessons do you draw from that reading?
10. Answer the same question with reference to the reading on London and New York as financial centers.
11. What is meant by saying that cheap transportation made the Mississippi Valley the greatest homogeneous market the world has ever seen and that this fact goes far to explain how American manufacturers were (later) able to invade even Europe with their products?
12. In the foregoing questions on the broad location areas of financial and marketing businesses, were there problems of personnel? of physical environment? of social environment?
13. Draw up an outline of the main points in this section.

1. A GENERAL SURVEY OF LOCATION FORCES[1]

First in importance in fixing the home of certain industries is the presence of natural deposits or supplies. This determines imperiously the location of mines, quarries, oil or gas wells, fisheries, lumber and fur industries, and the collecting of nitrates, borax, sponges, pearls, buffalo horns. Thus the Chilean desert is the site of nitrate mines, the oyster industry haunts the Chesapeakes, dye-woods are furnished from tropical forests, while the sulphur pits of Sicily supply brimstone to all parts of the world.

Besides the simple finding, digging up, breaking off, cutting down, dislodging, capturing, or bringing together of natural substances or growths, we often find these reduced, refined, prepared, preserved, or otherwise worked up before leaving their original locality. Here we may, in thought, distinguish two industries, one working on raw materials supplied by the other. Many elaborative processes are in this way attached to some extractive industry, and located with reference to it. The weaving of basketware established itself in Franconia, owing to the splendid growth of willowtrees in the neighboring valley of the Main. Most of the slate pencils of the world are made in the Thuringian forest, the site of the finest slate quarries.

[1] Adapted by permission from E. A. Ross, "The Location of Industries," in *Quarterly Journal of Economics*, X (1895–96), 247–68.

Probably next in importance is nearness to the sources of raw or auxiliary materials. This consideration will have most influence, first, when the materials are bulky and heavy relatively to their value; second, when the finished product embodies but a small part of the materials employed or contains much greater value; third, when transportation facilities are backward, or the materials are produced in a mountainous district or in the interior of a country where the cost of transportation is unusual. These conditions are met with in the metal industries, so that ore is for the most part smelted near the mine, if fuel be forthcoming. The sawmills in turn invade the wilderness or follow up logging streams in quest of their material. While there is no great shrinkage in sawing logs into lumber, the greater ease of handling is sufficient to carry the sawmill to the logs instead of the logs to the sawmill.

Here we bring in a new consideration—the fact that extractive and elaborative industries are linked together by technical as well as economic bonds. The perishability of the materials makes the location of the dependent industry in many cases something more than a matter of freight bills. Neither cane nor raw juice can be carried far without spoiling, for a similar reason salmon canneries will cling to the banks of the Columbia, while fruit and vegetable canneries will stick close to Maryland orchards and California ranches. Tnis tether that binds one industry to a certain spot, despite the economic attractions of other localities, is weakened by every new device to preserve form and stay decay. So far, the frozen meat cargoes and refrigerator fruit shipments are in the service of the consumer rather than of dependent industries; but we may yet see these industries set free to obey other forces of location.

Whenever great heat is needed, it is impossible to ignore the sources of fuel supply. This, therefore, is of great importance in locating the metallurgical, chemical, and refining industries, the smelting, casting, rolling, or forging of iron or steel, the manufacture of brick, hardware, glass, stoneware, pottery, and porcelain.

When coal is burned simply to develop steam power, its cost of carriage is not so great as to make nearness to source of fuel a prime desideratum in location. Its rival, water power, on the other hand, has not been portable in any form, and, if used at all, has to be used in strict connection with the falling water that generates it. Around eligible water power, therefore, settle industries employing heavy machinery, such as flour mills, planing mills, sawmills, and many

manufactures of wood and metal. The manufactures that seek cheap power are mainly those that receive the crude natural materials direct from the extractive branches, and impose on them their first and greatest change of form. For the more purely elaborative processes, lying nearer the consumer, labor and light machinery effect the transformations.

A power site thus becomes the core of an industrial center. Lowell, Lawrence, Fall River, Concord, and other manufacturing towns on the streams tumbling from the granite hills of New England owe their rise to this cause. The South owes part of its growth to the falls in its rivers. Great milling centers, like Rochester, Niagara, and Minneapolis, are the result of cheap power. It is likely that, with the advent of the economical transmission of electrical energy to a distance from the place of generation, the value of the more eligible power sites will be enormously increased; while, on the other hand, the concentrating tendency being checked, the milling industries will be left free to follow other attractions.

Sometimes a trade takes up its home where, as supplement to some other branch it can fill up an industrial chink. In Switzerland hand-carving maintains itself because not only can it be pursued in the winter and in the long evenings, but the occupation is so light as to refresh rather than to weary. The poultry industry is in most countries scattered and conducted in a small way, because it fills a chink in farming, and up to a certain point costs almost nothing. A great deal of stock-raising is merely incidental to farming. The peach industry of Belgium is likewise a parasite. The clusters of site industries that grow up about packing establishments, refineries, or gas works, engaged in turning refuse into by-products, are also parasitic. We note, on a higher plane, the obvious connection between the literary and scientific life of an educational center like Leipzig and its prominence as a book mart.

Climate is not only decisive for vegetal products, but appears to play no small rôle in locating manufactures. Partly to the fact that a very moist atmosphere is necessary in order to spin the finer cotton yarns is due the steady concentration of the cotton industry in Lancashire, where high hills inland keep off the dry east wind, and precipitate a copious downfall from the sea winds from the west.

The residence of the consumer frequently determines the location of the industry. The whole groups of service industries of course follow the consumer. In fact, the chief economic difference

between goods and services lies in the fact that the place of production of the latter is in relation to the consumer. Besides this, certain industries that produce goods, such as tailoring, millinery, photography, and pharmacy, must refer to the person of the consumer. Repair, work settles near him. Confectioneries, bakeries, and market gardens must be near him to avoid deterioration of product. Daily newspapers are published where the readers dwell, in order to secure promptitude. The bulk and waste of artificial ice in transportation, as well as the bulk of coopers' products, compel them to be made where wanted.

If raw materials, fuel, and power are necessary to production, no less are labor and specialized capital. The capital required for buildings and machinery is, however, rarely influential in locating an industry, because the buildings are locally supplied, while machinery, if brought from elsewhere, is transported once for all, and cannot therefore compete with material or fuel as a factor in location. Capital, the most mobile and dynamic factor of production, seeks its allies instead of requiring them to come to it. It effaces itself in the location of industries, consulting always the local affinities of the other productive factors.

Labor is not sharply localized, as is natural power, for instance. Like fuel or materials, it can be transported; and, like them, its prices in different markets perpetually tend to converge. But the transplantation of the laborer entails the expense of transportation of himself, family, and belongings, and all the costs in trouble, risks, and sentiment that attend a change of residence. While the elaborative industries performing the first operations on nature's products are the most regardful of nearness to materials, fuel, and power, the higher branches that fabricate finished goods are apt to attend more carefully to labor cost. In the manufacture of clothing, linen, underwear, gloves, boots and shoes, millinery, cigars, patent medicine, and cutlery, the cost of labor enjoys the controlling position. Apart, therefore, from the cost of moving materials or product, industries will tend to congregate in commercial centers, in order to profit by the cheapness of labor that results from a cost of living kept low by easy resort to a wide supplying area.

Many items enter into the articles of union between labor and capital besides the matter of remuneration. Cash wages, prompt payment, notice of discharge, liability of employer, provision of fire-escapes, fencing of machinery, limited hours for women and children—

all these obligations, whether imposed by law or by labor organizations, will, if unattended by heightened efficiency, be unfavorable to capital and may lead to its migration. So, too, industrial disturbances, rioting, frequent and prolonged strikes dispose capital to exodus if a more tranquil seat can be found. With more capitalistic methods of production, outlay for labor and material diminishes relatively to that for plant and machinery. This necessity for specializing and sinking vast initial sums makes industry increasingly dependent on order, security, and continuity of conditions. Civil disorder, revolutionary changes, sudden alterations in laws, or even a vigorous reform policy, scare away capitalistic industries. On the other hand, docility of laborers, absence of trade unions or restrictive laws, unquestioning submission to the terms offered by capital, attract an industry. Easy incorporation, light taxes, severe penalties for offences against property, lavish grants of authority to private watchmen, such as the Coal and Iron Police of Pennsylvania, prompt use of police or militia in labor disputes, pliant legislatures, complaisant courts, corrupt officials—all these, so long as they provoke no dangerous reaction, attract outside capital, and make a community the home of vast industrial investments.

Occasionally we find industries confined to a certain locality because of dearth elsewhere of adequate technical knowledge and inventive talent. The manufactures of one country get a start, and by a recourse to native technique are able to keep their lead. In the manufacture of dental instruments and supplies Americans have unquestioned leadership, owing to their inventive faculty and to the constant stimulus afforded by a highly developed profession. Similar causes give them pre-eminence in the making of farm machinery, while the ingenuity with which utility and convenience are wrought into their implements and tools gives American hardware a great name abroad. The lead acquired by France in articles of beauty and taste is undoubtedly due to the presence of abundant and well-organized artistic ability. The high development of the chemical industries in Germany is connected with the ardent cultivation of chemical science in that country. While, of course, experts may be transported as any other factor in production, experience shows that an industry permanently dependent upon imported technical knowledge will pay high salaries and receive service less conscientious, responsible, and well considered than would be rendered by the same men at home.

The concentration of a scattered industry usually comes about by some locality outstripping the other centers and finally extinguishing them. The initial growth is due, of course, to some superiority of this locality over the others. But, as the center leaves its rivals behind, it acquires a momentum from the fact that the economies of concentrated industry now work in its favor as well as its special advantages. With these urging it in the same direction, one might wonder why the rising center does not go on killing out its small rivals over larger and larger areas and appropriating their business. But trees do not grow up into the sky, nor does an industrial center expand till it absorbs the custom of the globe. For this there are two chief reasons. One is that, as a place becomes more of a center, its special advantage tends to disappear. If it is water power, the multiplication of mills raises the cost of power till it is no longer cheaper than elsewhere. If it is accessible coal, the increase of consumption compels shafts to be sunk deeper and galleries to be cut farther till the local superiority has vanished. The other reason is that, as industry concentrates, the radius of the territory from which its materials and the subsistence of its dependent population are drawn, and of the territory over which the finished product is distributed, increases; the average cost of transportation per unit of industry grows until its growth neutralizes the economics of further concentration.

2. TRANSPORTATION FACILITIES IN RELATION TO LOCATION[1]

[The following selection, by its excellent portrayal of the general consequences of improvements in transportation will serve sufficiently to indicate what must be the consequences of particular rate structures if they greatly favor certain localities or commodities. There is a further hint of the part played by rate structures in Selection 5.]

The indirect results of these changes [improved transportation] are so far reaching that we can do little more than enumerate them. The most immediate effect of cheapened transportation is to increase the distance at which it is possible for producer and consumer to

[1] Taken by permission from A. T. Hadley, "Economic Results of Improvement in Means of Transportation" in Lalor's *Cyclopaedia of Political Science, Political Economy and the Political History of the United States*, III, 929–30. (Maynard, Merrill and Company, 1899.)

deal with one another. To the producer it offers a wider market, and to the consumer more varied sources of supply. Which party obtains the chief benefit of the change is determined by the special conditions of each particular case. On the whole, its operation is more uniformly beneficial to the consumers, as a class, because its temporary advantage for the producers so often leads to overproduction. But in any event, it results in doing away with a large part of the variations in price between different localities. The price is made, not in a local market, but in the world's markets. In the case of less bulky manufactured products, these differences almost disappear, except as they are due to artificial obstructions. In agricultural products, they are on a vastly smaller scale than ever before. And not the least important point where this leveling effect is felt is in the rent of agricultural land in England and similarly organized countries. Nearness to market was not long ago a main advantage of high-priced land; now it has to contend on tolerably equal terms with competing land five thousand miles away.

To comprehend the full meaning of this change, we have only to look at books on industrial organization, published in the early part of this century. The limits from which a large city could draw its various supplies were closely defined by distance. Fresh vegetables and fruits could only be produced for it within the narrowest circle; and successive circles of ground were almost necessarily devoted to different products, according to their different availability for transportation. Now, any improvement by which products could be profitably transported to a greater distance, led to a redistribution. It was no longer location which determined the business to be carried on in a particular spot, but natural advantages more or less independent of location. The market garden might be placed at a greater distance from the city, if by so doing a more fertile spot was secured. The factory might be located far away from the raw material, if other business inducements made it desirable. In short, the whole system of division of labor advanced to a new stage. Not only was each man employed for what he could do best, but he was given a chance to work in the place where he could do it best. And this change made itself strongly felt in international relations. Even the barriers raised by high protective tariff today should be less isolated by this than it would have been a few years ago by the mere cost of transportation with no tariff at all. It is the railroad and the steamship that determine where a new business shall be developed,

quite as often as the government policy. The grant of special rates and privileges to shippers is nowadays the most efficient kind of protection.

It is this quickening and cheapening of transportation that has given such stimulus in the present day to the growth of large cities. It enables them to draw cheap food from a far larger territory, and it causes business to locate where the widest business connection is to be had, rather than where the goods or raw materials are most easily procured. And the perfection of the means of communication, the postoffice and the telegraph, intensifies the same result.

3. THE MOMENTUM OF AN EARLY START AND THE HABIT OF INDUSTRIAL IMITATION[1]

The various advantages which have been described thus far can be expressed in dollars and cents. The places possessing these advantages attract manufacturers on account of the comparatively low cost there of producing and marketing goods. But these advantages, in almost all cases, account for localization only in its broader sense. They prescribe an industry's possible area, but they fail to explain the most marked form of localization—that within a single city or town or group of cities and towns.

Somewhere within the possible area—made such because of the advantages just described—an enterprising man started the pioneer establishment of a certain industry. Why was this place chosen rather than any other within the possible area? Or why was this industry chosen rather than any other for which this place was suited? This is the first problem, and the second follows naturally. Why, after the first factory had become established, was it to the advantage of competitors to choose the same spot for their establishments, rather than other localities within the possible area? The solution of the first problem in the case of any industry is to be found by reference to its early history in this country.

In most cases it will be found that the original establishment of an industry in a locality was largely a matter of chance. The shoe industry in Lynn, Massachusetts, is a case in point. In the early colonial days this settlement had its quota of cobblers, who made as well as repaired the shoes for the region thereabout, but did not attempt a broader market. In 1750, however, John Adams Dagyr, a Welshman and a skilled shoemaker, settled in Lynn, and began to

[1]Adapted from *Twelfth Census of the United States*, VII (1900), 210–14.

teach his apprentices the art of fine shoemaking. It soon became known that shoes were being made in Lynn nearly as good as the best made abroad, and as early as 1764 Dagyr was spoken of in a Boston newspaper as "the celebrated shoemaker of Essex." Had this man settled in Roxbury, Massachusetts, rather than Lynn, the bias toward shoe manufacturing might have become established in that quarter, and Roxbury instead of Lynn might today be one of the three great shoe centers of the United States.

The nature of many a city's industry has been shaped in just this way, in the early days of its history, by the decision of one man. Instances of this might be cited in connection with the localization of collars and cuffs, hosiery and knit goods, jewelry, gloves, and fur hats.

It is only after the first enterprise has succeeded in any locality that the real localizing process begins. The mainspring of this process is the habit of industrial imitation—a habit as powerful as it is universal, and so important in this connection that it warrants a somewhat closer analysis.

It has been shown above that one of the normal requisites of an industrial locality is a good supply of local labor and local capital. Suppose the enterprising man establishes himself in such a community and succeeds there. His success proves that the economic conditions are favorable—that he is within the possible area of that industry. But it does more, it creates a local bias toward this particular industry. This bias affects all three classes necessary to its expansion: entrepreneurs, capitalists, and laborers.

In the first place, entrepreneurs naturally choose the existing industry rather than establish a new one. On the assumption of a prosperous and growing town, there is continually arising a class of enterprising men who wish to embark in manufacturing for themselves, and they naturally choose an industry with which they are familiar—one which they have actually seen succeed. It requires courage to be an industrial pioneer; more courage, in fact, than most men possess. They have read, perhaps, of much larger profits being made in branches of manufacturing not carried on in their neighborhood; they may have visited towns in another part of the country where some such industry has been very successful, and they are tempted to establish this industry in their town, rather than to imitate the establishment which has been operating there successfully. The chances are great, however, that they will resist the temptation of larger profits, in favor of what they regard as surer profits, and will choose the local

industry. The other industry may be just as safe, but the probability of success, if they follow the beaten path, has been emphasized to them each day as they have watched the smoking chimney of the local factory, and have noticed the rise of the proprietor from moderate circumstances to comparative affluence. Their choice of this industry becomes, therefore, almost inevitable. Moreover, it is probable that the men who thus launch out for themselves have been employees or foremen in the local factory. They are relatives, perhaps, of the proprietor, and are familiar with all the details of this industry, while in any other they would have all to learn.

In the second place, the capital needed to finance the new establishment—in addition to that supplied by the new entrepreneur himself—is much more easily obtained if the new establishment is to produce the same line of goods as the one already in existence. If a loan is desired for the establishment of an outside and less familiar industry, there is naturally a raising of the interest-rate as a means of insurance; or the stock, if offered for sale, will for the same reason sell at a lower figure.

In the third place, the best grade of local labor prefers to have employment in an industry which seems to offer a future rather than in one which seems in the nature of an experiment. This influence is comparatively slight, however, for all ordinary labor takes such employment as is offered without much questioning.

4. SOME ECONOMIC ADVANTAGES OF SPECIALIZED CENTERS[1]

Whatever the influences which bring an industry to a district, the chief advantages of localised industry are all due to the opportunities for greater specialisation which concentration affords. Where many firms engaged in the same industry are grouped together, the worker has a better market for his specialised skill and is encouraged to specialise still further. The employer has less difficulty in finding the kind of labour he wants. The industry can command a large number of special services which no single firm could afford, and no scattered industry could maintain. Among the most important of such services is the specialised market. Liverpool and Manchester provide the cotton-spinner and manufacturer with facilities for getting their raw materials and disposing of their finished products which

[1] Taken by permission from Henry Clay, *Economics, an Introduction for the General Reader*, pp. 30–31. (The Macmillan Company, 1916.)

they could find nowhere else, and these facilities can be supplied only because the cotton industry is so strongly localised. Bradford is the centre of the woollen and worsted industry, and nine-tenths of the wool that enters the country is bought and sold on the Bradford Exchange. The goods of the locality advertise one another, making access to new markets easy and giving an advantage in old markets; merchants and other distributing facilities grow up; "to be a Huddersfield worsted manufacturer or a Galashiels or Hawick tweed manufacturer is enough in itself to raise the individual out of the ruck of some sort of competition and to justify the asking of a certain price." Special transportation facilities and the provision of commercial intelligence can be arranged for a localized industry. Scientists, lawyers, accountants, find it worth their while to specialise in the problems peculiar to the local industry. Insurance can be effected cheaper. Probably the use of credit can be obtained cheaper where risks and conditions are so well known as they are in a modern specialised locality.

An important type of specialised services is the growth of subsidiary industries, supplying the staple industry with its machinery and incidental requirements of manufacture, and utilising its by-products. The making of machinery is less localised than other great industries, because the requirements of a modern localised industry are so special that they can best be met by a firm on the spot. The textile districts are the seat also of the dyeing and finishing trades, specialised to suit the particular material manufactured in the district; and these in their turn attract certain chemical and drysalting trades. The complete utilisation of by-products is one of the most important economies of modern industry, and is possible only where a localised industry makes a large bulk available without transport charges.

5. THE LOCATION OF THE COTTON MANUFACTURING INDUSTRY[1]

[This selection should be regarded as a bit of case material. It should be read with the mind searching for evidence that in plant location there arise matters connected with the relationships sketched on page 15.]

New England.—Till 1880 the cotton-manufacturing supremacy of New England was not threatened. But when mills began to

[1] Adapted by permission from M. T. Copeland, *The Cotton Manufacturing Industry of the United States*, pp. 27–53. (Harvard University Press, 1912.)

spring up in the South like mushrooms, grave fears were entertained for the future of the industry in the section where it had first taken root. These fears have now almost entirely disappeared, since by readjustment and economy the New England manufacturers have given evidence of being able to keep their foothold.

Within New England the mills are still scattered, but certain localities have grown faster than others. The reasons for the more rapid growth of the industry in these places are the advantages which accrue from centralization in general, and the natural advantages possessed by the different localities in particular. In the early growth of the cotton manufacturing industry in New England the factor which determined the location of the mills was water power. Fall River, Lowell, Lawrence, Manchester, Nashua, Saco, Lewiston, and other cities grew up because of the water power which was available at those points. Although water power is still a very important factor in the continued prosperity of several of these cities, during the last half-century steam has become more important in supplying power for cotton mills.

The more rapid growth of the industry in southern New England cannot be ascribed to water power. Fall River and New Bedford do not rely upon that to a great extent. Nor is the reason to be found in labor conditions, since the more northern cities possessed as large and as skilled a supply of labor as Fall River and New Bedford, when the latter cities began to forge ahead. Nor is the location of machine and repair shops the reason, since Lowell is well provided for in that respect.

One reason, as Mr. Sidney Coolidge has pointed out, is the advantage which the tide-water cities gain in transportation rates. This saving, however, is not in the rates on raw cotton, since for that portion (about 40 per cent) which is shipped to the North by rail, a blanket rate is given for all New England and the railroads meet the water rates. Neither does the advantage arise in the freight on the cloth, since practically the same rate is paid from all sections of New England to New York or the West. The tide-water mills, however, are able to obtain their coal at lower rates, inasmuch as the charges from Boston to points north are relatively high. The cost of discharging coal is about the same in Fall River and New Bedford as in Boston, and in the former cities it can be sent directly to the mills without further transportation. Thus, as the use of steam power has become more and more common, cheaper coal has favored the cities of southern New England.

Climatic conditions have been another reason for the more rapid increase in the number of spindles in that district. In that particular locality the temperature is less variable and the atmosphere more humid than in the neighboring regions. The climate has been particularly adapted to the manufacture of fine yarn and cloth. Although the natural advantage of humidity has been partially equalized elsewhere by artificial humidifiers, the greater stability of the temperature retains its potency.

Middle Atlantic states.—The number of spindles reported for the Middle Atlantic states in 1860 was 1,042,000; in 1900, 1,647,000; and in 1905, 1,548,000. Thus since 1860 the industry has been practically stationary in this section.

Cotton factories are located in Pennsylvania, New York, and Maryland, and a few are found in the other states of this group. But Philadelphia is the only point at which there is a concentration. In the Philadelphia district small weaving establishments are particularly numerous; three-fourths of the mills in the United States which weave but do not spin are located in Pennsylvania, chiefly in Philadelphia, and the average number of looms per mill is only 101. Textile manufacturing is a long-established industry in that city and immigrant labor was probably employed there sooner than in New England. The immigrants, however, who entered the textile industries of Philadelphia were more or less experienced in textile manufacturing and therefore could be employed in the production of more fancy fabrics. Thus we can account, at least in part, for the existence of these mills and the character of their product. The labor supply has been the chief asset, supplemented by machine-shops and market facilities. The textile industries of Philadelphia, moreover, are urban enterprises dependent on urban conditions and in that respect are more or less analogous to the clothing industries of New York.

The South.—The cotton-manufacturing industry has grown up in the South within the last thirty years, or since 1880. From 1900 to 1905 the rate of increase was more rapid than ever before, but at the present time a more conservative tendency is apparent.

The most extensive construction of mills has been in three states—North Carolina, South Carolina, and Georgia. Alabama has also had an important share in the progress, although not to the same extent as its eastern neighbors.

The advantages usually specified as the reasons for the progress of cotton manufacturing in the South are: (1) proximity to the source

of supply of raw cotton, whereby the spinner is enabled (*a*) to save in freight rates on raw material, and (*b*) to take advantage of favorable market conditions; (2) water power; (3) lower taxation; and (4) cheap labor. To what extent has each of these alleged advantages affected the development? How far are they still operative? And in what degree are they offset by disadvantages?

1. *a*) A saving in freight on raw materials is doubtless realized by some mills, but this economy is not so great as would at first sight appear. Where the mills have become so numerous that the local supply is insufficient to satisfy their demands, the price paid to the local merchants for cotton grown in the immediate neighborhood is equal to the cost of the cotton in other states plus the freight charges. Economy in freight on raw cotton is realized only by the mills in the more southern part of the cotton-manufacturing district, and probably a majority of the southern spinners pay nearly as much as the New England spinners for their raw material. Furthermore, the cloth is generally shipped to the North. There are practically no bleaching, dyeing, or printing works in the South, as the water is not suitable. Hence if the cloth is to be finished it must go to the North, usually New England. And if it is to be exported in the gray it is generally shipped through New York, sometimes through Seattle. Since the market is in the northern states, it matters little, so far as freight charges are involved, whether the cotton is shipped before or after manufacturing. Until the South is able to obtain pure water for finishing and becomes commercially independent of New York by establishing its own export market, the saving of freight on raw cotton will be counterbalanced by the freight on the cloth. When that goal is reached, if at all, the growth of the industry may have forced all the manufacturers to obtain at least part of their cotton from distant states and thus nullify what slight advantage now accrues from proximity to the cotton fields.

b) The proximity of the southern manufacturer to the source of supply of raw cotton does not enable him to gain any advantage of purchasing. The New York price rules and that quotation depends upon the state of the world's cotton market. There is not sufficient divergence in any locality to place local manufacturers in a superior position. In the second place, the majority of the southern manufacturing companies have not as much ready money as the New England mills. It is available cash rather than geographical location which determines who will be able to buy cotton when the price falls.

2. The saving in cost of power is a more difficult point to decide upon. A number of mills are located on streams where they can use water power, and their charges for this element in the cost of manufacturing are small. But the spot where water power can be secured may be remote from the railway and may involve other sacrifices. Moreover, less than one-fourth of the power for southern cotton mills is furnished by water. For those using steam the cost of coal varies, being cheap in Tennessee where there are local mines and dearer in other states, according to the distance it must be transported. While cheap power has encouraged the inception of some of these cotton-manufacturing enterprises, it has not been general enough to be considered the paramount factor in the whole movement.

3. Southern municipalities have frequently exempted the mills from taxation for a period of years as an inducement to location within their borders, and the rates are generally lower than in the North. But the southern mill owners, in contrast with those of New England, have had to provide sanitary improvements, and to subsidize schools, churches, and other public institutions in their villages.

To offset whatever gains may have accrued to the southern manufacturers from the minor advantages already mentioned, the dispersion of the mills must be reckoned with. The factories are scattered throughout the Piedmont district, from Greensboro in the North to Atlanta in the South, and also here and there in the lowlands. Charlotte, North Carolina, is the commercial center for a large part of this district, but there is no considerable localization. The cotton industry, however, like many others, is naturally gregarious, and thrives best where the labor market is fairly steady and where repair shops are close at hand. This source of economy is realized in New England but not in the South. Yet this inconvenience will probably disappear along with other advantages and disadvantages, as the industry emerges from the period of transition.

4. Although these advantages have aided mill-building in the South the corner stone of the structure has been the supply of cheap and tractable labor.

The lower wages, nevertheless, have been partially counterbalanced by the lack of skill and the fickleness of the workers. They had to be taught how to manage the machines, and while they have learned readily, they are even now inferior artisans to those New England operatives who have worked in cotton mills for a longer time.

The efficiency of the southern operatives has also been impaired by their inconstant attendance.

Although the wages and probably the labor cost have been lower in the South, at present they have risen almost to the level of New England. The growth of the industry has taken away the advantage which was its chief asset. The stratum of cheap labor has been exhausted and in the boom of 1905–7 employers bid against each other so that wages were raised nearly one-fourth.

The management of southern mills has generally been inferior to that of the northern factories. It has been less systematic and less economical. The superintendence has been less careful and the cost-keeping less accurate. The managers have been for the most part trained in southern mills, and the overseers are commonly southern-born and have gained their experience in the mills of that section. In the early years a few of the overseers and managers were northern men who had been sent to erect machinery in the South, but not many such are to be found at the present time. Besides their laxity in management the southern manufacturers have not taken care to keep up the quality of their product with the foresight that is characteristic in New England. Southern goods bring a slightly lower price than northern cloths, not only because of inferior workmanship, but also because they are less trustworthy. Since the southern manufacturer is more likely to use poorer cotton or economize in some other way rather than incur a temporary loss, the reputation of his cloth suffers. There are numerous exceptions, however, and the general tendency is toward better management and maintenance of quality.

The capital for building the earlier mills was obtained in the South itself. They were small establishments and represented the savings of local business men and farmers. Frequently the mill-building was short-sighted, local pride and the infectious spirit of the moment blinding the promoters to the inadvisability of investment in the manner pursued. Such mills have frequently failed and passed through numerous reorganizations. The speculative mania introduced an element of unsteadiness, but this, as in other industries, was an incident of early growth and on the whole contributed to the establishment of the new business in the South.

Once the profitableness of cotton manufacturing in this section had been proven, capital flowed in from the North, in part from bona fide

investors and in part from other sources. Of the latter, the machinery manufacturers were heavy contributors. They took shares in the company's stock in payment for machinery, just as the English machinery firms have done during the recent period of rapid erection

NUMBER OF COTTON SPINDLES, BY COUNTIES, 1913

This map shows at a glance the concentration of the cotton-spinning industry in this country. The amount of such spinning done in the western half of the country is negligible.

of mills in Lancashire. The machinery companies, in both countries, unloaded the stock at their earliest opportunity.

Stock in southern mill companies has also been taken by business firms which have held the stock but with the object not so much of securing interest on the investment as of obtaining remunerative

privileges. These firms were New York commission houses which purchased stock on condition that they be granted the agency for the product. These financiers, however, more commonly helped to supply ready money by making advances on the goods with a lien on the cotton as security, instead of accepting shares of stock.

Several mills have been built on southern soil by New England companies, with a view to profitable investment and because of apprehension that the industry was to shift away from the North.

To summarize the present situation: The advantages accruing to the southern manufacturers from proximity to the cotton fields, good water power, light taxes, long hours, and new machinery are counterbalanced in the North by more abundant capital and credit facilities, greater public conveniences, more experienced managers and better disciplined workmen, concentration instead of dispersion, superior climate, and nearness to markets and finishing works. The chief asset of the southern manufacturers has been the supply of cheap labor, but this source is nearly exhausted. Hence a rise in wages has taken place, and it is to be expected that by the competition of employers they will be forced up to the New England level. Few more native whites are to be secured; the negroes are unavailable; and immigrants cannot be attracted by low earnings.

6. LOCAL CONCENTRATION OF CERTAIN INDUSTRIES[1]

The following table brings out the most conspicuous instances of concentration. In each industry named in this table a single state in 1909 contributed more than two-fifths of the total value of products:

Industry	State	Per Cent of Total Value of Products for United States 1909
Collars and cuffs	New York	92.3
Grindstones	Ohio	88.8
Artificial flowers and feathers and plumes	New York	88.2
Peanuts, grading, roasting, cleaning, and shelling	Virginia	81.5
Plated ware (not including silversmithing and silverware)	Connecticut	77.4
Fur goods	New York	73.8
Clothing, women's	New York	70.8
Hair work	New York	70.1
Liquors, vinous	California	68.1

[1] Adapted from *Thirteenth Census of the United States*, VIII (1913), 127–28.

Pens, fountain, stylographic, and gold	New York	67.9
Needles, pins, and hooks and eyes	Connecticut	63.3
Gloves and mittens, leather	New York	60.7
Millinery and lace goods	New York	60.7
Pipes, tobacco	New York	60.5
Firearms and ammunition	Connecticut	58.6
Rice, cleaning and polishing	Louisiana	56.0
Clocks	Connecticut	55.7
Coke	Pennsylvania	54.1
Iron and steel, steel works and rolling mills	Pennsylvania	50.8
Turpentine and rosin	Florida	47.2
Furnishing goods, men's (not including collars and cuffs nor suspenders, garters, and elastic woven goods)	New York	46.9
Clothing, men's, including shirts	New York	46.8
Boots and shoes, including cut stock and findings	Massachusetts	46.1
Ink, printing	New York	45.8
Brass and bronze products	Connecticut	44.6
Iron and steel, blast furnaces	Pennsylvania	43.1

It would require very extended discussion to determine for each industry the reason for the concentration in the states or cities named. Moreover, such a discussion would involve a great deal more of mere speculation, as the reasons for local concentration are often exceedingly obscure. It is necessary for the most part to confine the discussion to statements of a general character.

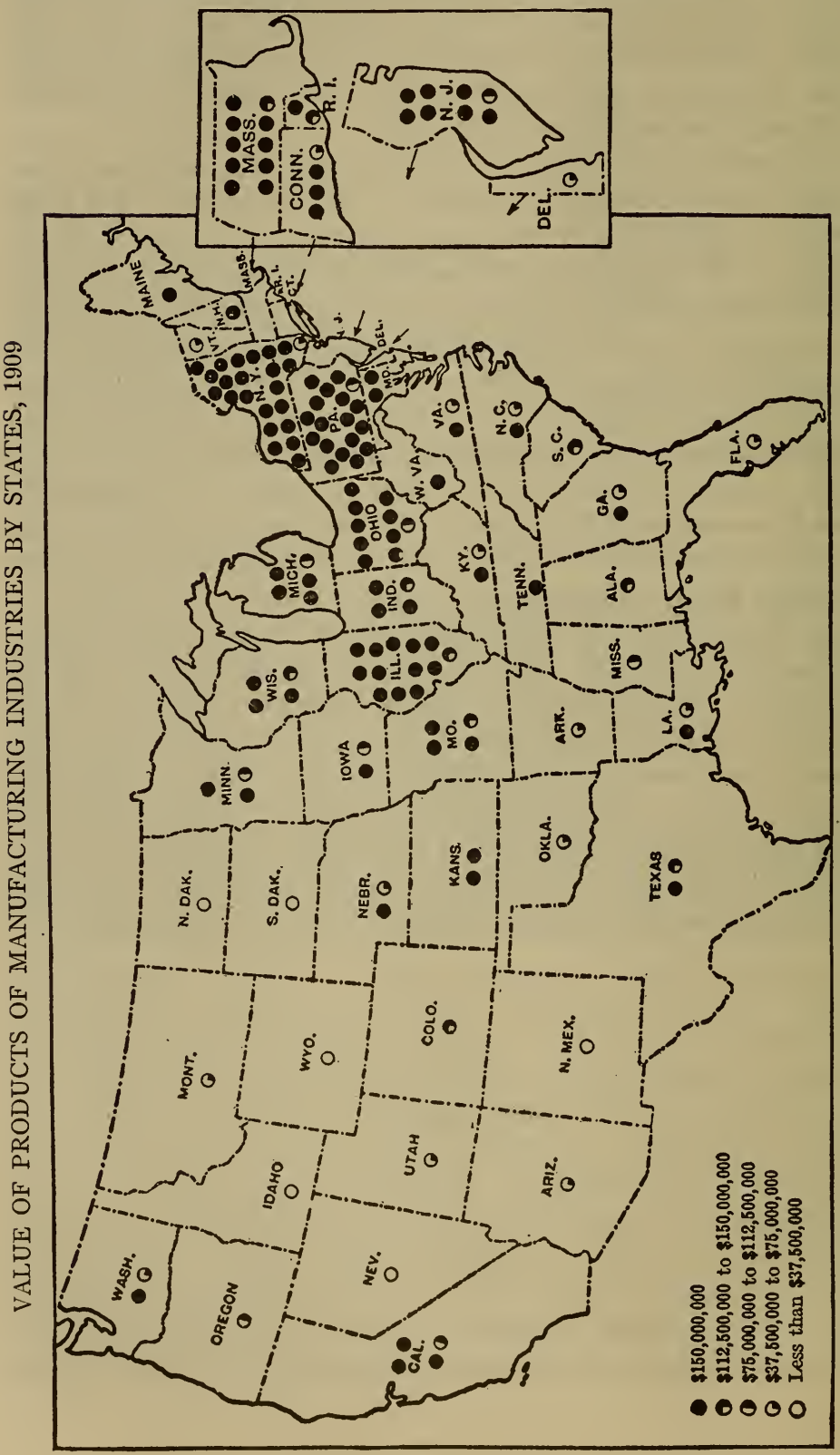
There are certain advantages which particular states or cities have with reference to manufacturing industries in general and which tend to give them prominence in manufactures as a whole. Among these advantages may be mentioned: (1) water power, (2) convenient transportation facilities, (3) large amounts of capital available for investment in manufactures, and (4) a large supply of labor adapted to manufacturing enterprises in general. Besides these broad factors which affect the geographic distribution of manufactures in general, there are others which tend to bring about a local concentration of particular classes of manufacturing industries. Among the principal factors of this class may be mentioned: (1) proximity to the source of the required materials, (2) proximity to the market for the specified products, (3) a supply of labor peculiarly adapted to the industry, (4) the momentum of an early start which is usually closely related to the labor supply, (5) the habit of industrial imitation. Moreover, some of the general factors above mentioned set more powerfully in the

case of certain industries than in the case of others. For example, water power is obviously more important in the case of those industries which require large quantities of power than in the case of those which require little power, and transportation facilities are more important with reference to heavy products than with reference to those of little weight in proportion to their value.

In some cases two or more factors co-operate in rendering a particular locality peculiarly favorable to the development of a given industry. Again, one or two factors may be so strong as to prevail in spite of the lack of favorable conditions in other respects; and part of the establishments in an industry may be concentrated in one locality or group of localities by reason of one set of advantages and part concentrated elsewhere by reason of a quite different set of advantages. For example, proximity to the market and the momentum of an early start may result in the concentration of an industry in a locality by no means convenient to the source of supply of raw materials. This is conspicuously illustrated by the manufacture of cotton goods.

In the case of those industries which are dependent upon materials produced largely throughout the country, the need of proximity to materials may result in a wide distribution rather than a local concentration of the industry. For example, the production of lumber is not locally concentrated in any marked degree. The lumber mills are in general situated in or near the forests, and the latter in turn are more or less generally scattered throughout the country. For similar reasons the flour-mill and gristmill industries are widely distributed. It is only where the production of the required materials is confined to more or less limited areas that the need of proximity to materials can bring about local concentration of a manufacturing industry.

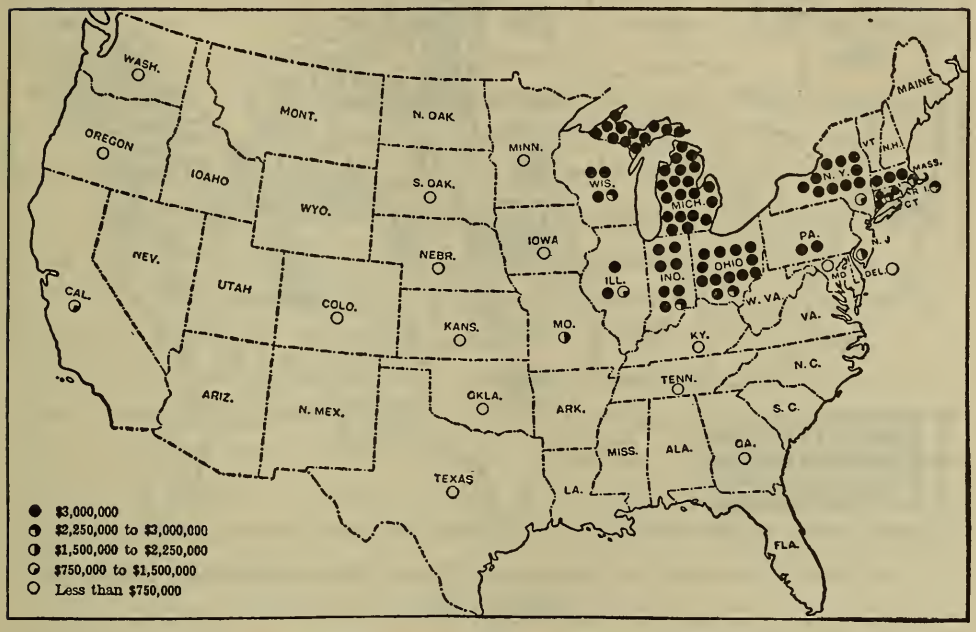
7. THE LOCATION OF THE MANUFACTURING INDUSTRIES OF THE UNITED STATES[1]



[1] Taken from *Thirteenth Census of the United States*, VIII (1913), 62.

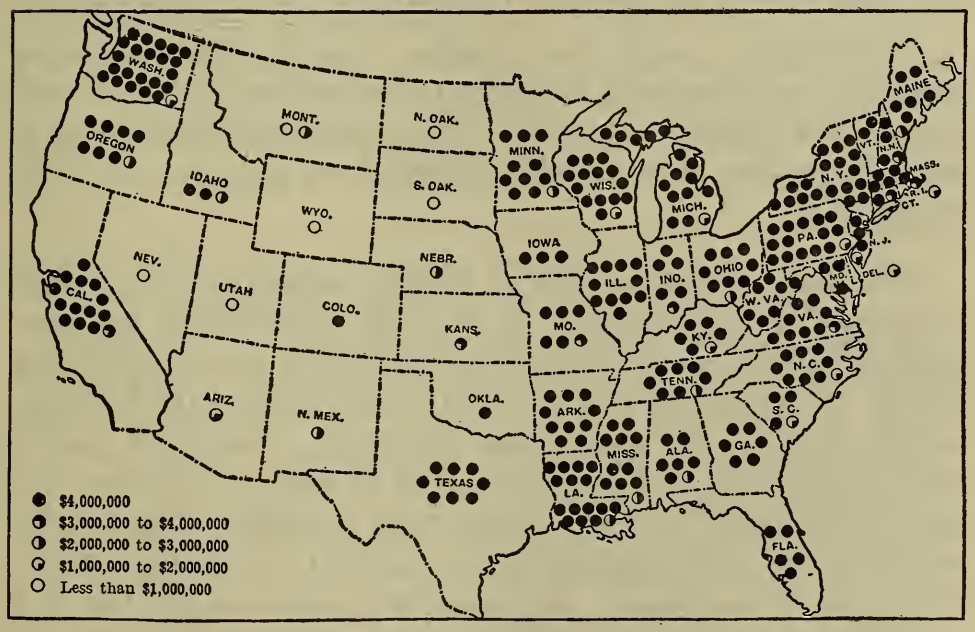
How do you account for the concentration indicated by this map? Does the outline on page 15 help you?

8. ILLUSTRATIONS OF CONCENTRATION AND DISPERSION[1]



1. VALUE OF AUTOMOBILE PRODUCTS BY STATES, 1909

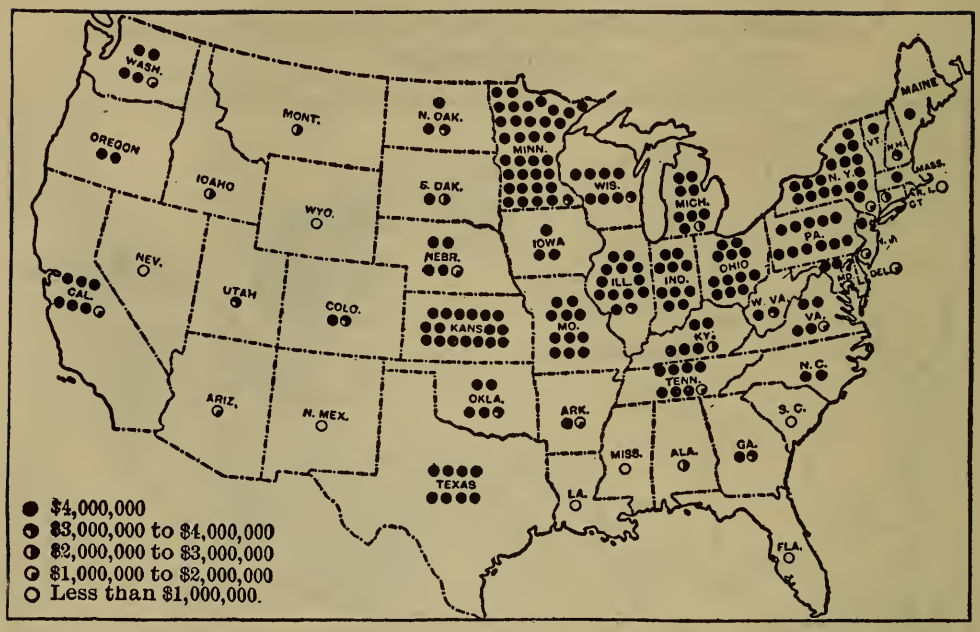
How do you account for the concentration indicated by this map?



2. VALUE OF LUMBER PRODUCTS BY STATES, 1909

How do you explain the dispersion shown by this map?

[1] Taken from *Thirteenth Census of the United States*, X (1913), 405, 492, 810.



3. Value of Products of Merchant Flour Mills and Grist Mills by States, 1909

How do you explain the dispersion shown by this map?

9. THE SEATS OF GREAT COMMERCIAL ENTERPRISES[1]

[This selection marks the transition from the discussion of the location of manufacturing industries to that of the location of commercial and financial industries. The student should still keep in mind the outline of relationships sketched on page 15. Is it still applicable?]

The place of transportation in making commercial cities.—Some advantage in transportation is the most fundamental and most important of the causes determining the location of the distributing center. It may almost be said to be the only cause for the formation of such centers. For some reason or reasons, a particular place is more conveniently and cheaply reached by many people than any surrounding point; and as a result, they naturally exchange commodities there. The country store is located at the crossing of roads. There also is the village. In a mountain pass, or a gap that is a thoroughfare between two valleys is another favorable location. If

[1] Adapted by permission from J. R. Smith, *Industrial and Commercial Geography*, pp. 840–75. (Copyrighted by Henry Holt and Company, 1913.)

rivers are difficult to cross, settlements will spring up at the safest ferries or fords. In a level plain, a town will be near its center, and a focus of roads or railroads in such a plain, fertile and populous, will also surely make a city.

The head of navigation on a river is a location far more commanding than any of those already mentioned. Here all the trade that goes by the river must be changed from one method of conveyance to another. Here goods are collected from the surrounding country for shipment by water. Here people bring the goods and buy their supplies. Here also must be merchants, forwarding agents, and the repairers of wagons and ships. A town or even a city arises. It is interesting to note that towns of this class were relatively much more important in 1800 than in 1900. In the first-named year a river offered a much greater relative advantage for cheap transportation. In 1900 the new means of transportation, namely, the railroad, had built up prosperous cities where under the old conditions cities were impossible.

The railroad train has rushed past the river port to the seaport, and the giant ocean steamer has taken the trade. The most commanding location for the commercial city is the safe harbor which is, or may become, the natural outlet for a rich and populous territory. The great seaport exists because it is a place for the breaking of cargo of ocean ships, just as the country store exists because the boxes and wagon loads of miscellaneous supplies must there be divided up into numerous small packages for the individual consumer. It must be a point as far inland as possible so that the importer and exporter may have the largest advantage of the cheaper freights possible on large ships. Therefore the greater ports are at the heads of bays and gulfs rather than on peninsulas and headlands.

Besides easy access from the sea, the great seaport, the international trade center, must have easy access to the land and to the centers of population that it serves. This access is best supplied by a river valley with the water transportation on the river itself and canals and railroads that can be built most easily along watercourses. Nearly all important seaports are at, or near, the mouths of rivers, navigable or otherwise, and, in regions having navigable rivers, the largest cities are in locations having the best communication with the interior.

Ports for raw materials and for manufactured goods.—One of the changes in the world-commerce of the past century has been the

pronounced separation of ports into classes. One class is the raw-material port, and another is the manufactured-goods port. The two are steadily growing more distinct at the present time.

The filling of the channels of trade with the many bulky, cheap, or perishable articles has produced new trade conditions with less dependence upon great ports and distributing centers. Cheap and bulky goods usually go to the best advantage in full cargo lots; and, as the vessel has to depend upon no other freight, it can load at any small port near the place of production. It is easy and profitable for a vessel to go to a small port of Florida or Georgia for a full cargo of phosphate or lumber, to a Chilean outport for nitrate of soda, to a West Indian outport for iron or bananas, to Cardiff, Wales, for coke, or to a convenient railway terminus in the Argentine Republic for wheat. These goods may also be imported by a small port for use in local industries that do not require a large population for the manufacture and distribution of the products. A railway, a pier, and a suitable warehouse may enable a small town to export or import raw material in bulk. The raw-material port therefore may be, and often is, a small port.

In contrast to this, only a large city can import or export cargoes of highly manufactured goods. These articles are consumed in small quantities. Much choice is exercised in their selection and purchase by the consumer. The retail dealer must exercise similar care and discretion in the selection of his stock. He can do this best in a great wholesale market where he can go from place to place and take advantage of the competition and variety of stock of many wholesale merchants. This is to be found only in a great city. This gives the city holding the trade conservative force that comes of its being known as a market. The trade in manufactured goods therefore continues to cling to the older distributing centers and devious routings long after it is possible to make direct shipments.

The natural trade of an entrepôt.—One commercial center can at times distribute a certain product or products to most of the trading world and, for those products at least, it becomes a world-entrepôt. The commodities that lend themselves to this method of distribution must have special qualifications. The goods must have high value, small bulk, and good keeping quality. By having high value the freight rate is relatively insignificant and the long and devious journeys are not a serious handicap. Having small bulk there is not the demand for a whole shipload of them in any one

place, and so it is really cheaper to let them wend their way to transshipments through the common distributing center or entrepôt. A second factor of influence is the question of distance. The more remote the origin and destinations of the traffic the stronger is the hold upon this trade of the entrepôt with its organization of routes, ready to serve and hard to duplicate. The trade that best answers to this description and is therefore best fitted to be handled through an entrepôt is that from the Orient to the Western world. The shifting of this trade from route to route and from center to center is an interesting study of commerce as affected by war, politics, discovery, invention, geographic control, and the economic conditions that resulted from these forces. Owing to this complexity of shifting forces the profits and glory of being the Western entrepôt of Eastern trade have rested in turn with Venice, Lisbon, Bruges, Antwerp, Amsterdam, and London.

Causes of decline of world-entrepôt.—Two reasons will largely explain the passing of the world-entrepôt. First, the tremendous increase in the bulk of world-commerce. The second grows out of the first and is the multiplication of steamship and railway lines which enables many cities to serve as entrepôts for limited areas.

It must be kept in mind that decentralization does not destroy the old trade center. The statements concerning declining importance are relative, applying to percentage of rapidly growing wholes, and not in any way to absolute quantities.

The buying and selling of distant commodities.—A city may be a commercial center in two ways—first, as an actual distributer of goods; second, as a transaction center. The transactions in C often relate to goods in A to be sent directly to B. The transaction center is the lineal descendant of the eighteenth-century distributing center. In the days when the communication of ideas and the carriage of goods depended upon the slow and uncertain sailing vessel, or the equally slow and uncertain means of land conveyance, it was usually necessary to have the goods on the spot before they could be the subject of bargain or sale. However, the steamship, the railway train, and the telegraph have made a commercial world, new in its methods of management as well as in its staple commodities. The telegraph gives instant and constant information concerning stocks on hand, the crop prospects, and other conditions that affect the prospective supply. The steamship gives quick delivery; and, what is of equal importance, it far exceeds the sailing vessel in the certainty

of reaching port in a stated time. Commercial transactions of today may thus concern commodities in distant places and for future dates; and, although the movement of the goods may be decentralized, it still remains advantageous for the men doing this work to assemble in groups at some convenient center.

Centers for management of trade.—These transactions are centralized in the commercial metropolis. Decentralization of commodity traffic has been an accompaniment of the growth of the new commerce; but the telephone, the telegraph, and the fast mail have helped to keep up the transaction center by putting the selling agent in easy communication with the factories and local centers of the producing and consuming districts in all parts of the world. Sales for the foreign trade or to the distant consumer cannot be easily arranged from cement works located in the Alleghany Mountains of Pennsylvania or Virginia, from the Georgia cotton mills, or from the phosphate mines of Tennessee or Florida. Consequently the selling agencies are in New York.

The transactions of the wider international trade are also centralized. London, the last great international distributer, is still a large international seller. With the new conveniences of telegraph and cable the London distributing merchant often found that, upon the founding of direct communications between foreign countries, he could continue to hold the business, although the goods no longer passed through London. He knew the conditions of both Eastern and Western markets, and the direct connections that have sprung up merely enabled him to deliver more quickly by shipping his goods direct. By this process, London has come to be a dealer in goods which may never at any time be within 5,000 miles of England. . . . . For example, London brokers and London merchants recently had a practical monopoly of the international sales of pepper, Manila hemp, Indian jute, and Burma rice (the chief supply for the world-market). The world's supply of each of these four commodities is produced in a comparatively small region and consumed all over the world. The high value and limited supply of the annual crop would probably lead to disturbing price fluctuations if the central London firms did not act as a sort of regulator. Being in constant communication with their numerous agents in the centers of production and consumption, having a world-knowledge of this particular trade, they are able to conduct business more safely than the firm in New York

or Marseilles, should it attempt to buy hemp, jute, or pepper directly from the dealer in the point of shipment.

The influence of capital.—The international transaction center requires a central location, a line of business that is carried on in widely separated places, and, in addition, an abundance of capital. Capital must be more plentiful in the center than in the commercial outposts, for the central management of distant business operation is only possible by the use of capital from the controlling center.

As the trading countries come to possess more adequate supplies of capital for their own use, and when the trade assumes larger proportions, the international transaction center loses, at least proportionally. When the buyer and the seller can manage a transaction without mortgaging the goods in transit to a financier in a third country, there is less need of the services of the broker in the international transaction center. There is accordingly a tendency toward decentralization of management as well as a decentralization in the actual handling of goods. But the two decentralizations do not accompany each other. The direct movement of goods preceded in point of time the direct management of the business. The latter may be indefinitely delayed. The supplies of capital may remain low, causing dependence upon foreign bankers. Few countries have or promise in decades to have sufficient capital for their own needs. Since the commercial character of the traders in some countries is not reliable, no one dares trade with them who is not fully acquainted with them—which usually means having an agent on the spot. The trade of some countries will therefore continue to be largely transacted through the centers in the financial countries, although many products (usually the raw materials) go directly to the ports nearest the points of consumption.

The rise of international bargain centers in the United States.—The United States will join Western Europe in capitalizing the world's new enterprises and the financial centers of these countries will be the centers of control of industries in the other continents. As the continent gains relatively on England, Hamburg, Amsterdam, and Paris will continue to rise in importance, while New York promises to take a leading position. This is well shown by the present dominance of that city in the industries of America. There is the headquarters of the United States Steel Corporation, a veritable kingdom of riches in numbers of persons dependent upon it, and in the scope

of territory owned and covered, for its engines throb and its machinery roars in the states that border Canada and the Gulf, the Pacific and the cold New England Atlantic. In New York are consummated the deals in Montana and Arizona copper, Oklahoma oil, Maine spruce lands, Georgia pine lands, Susquehanna water-power plants, Virginia railways, Florida phosphates, West Virginia coal, Pennsylvania cement works, and the chartering of ships for Galveston cotton. Most of the railroads of the country have offices there, and those who supply them must also have offices there. The list might be drawn out indefinitely, for there is not a state or territory in the Union that does not have lands, enterprises, and resources managed from New York, the bargain center of the American people.

10. THE LOCATION OF THE WHOLESALE DRY-GOODS TRADE[1]

[This selection may well be read with the mind reaching back to the commercial location factors sketched in Selection 9 and at the same time reflecting upon factors making for change in location.]

An approximate idea of the situation in the trade may be gathered from an analysis of some of the directories of the trade which are accepted as being of sufficient fulness to be useful.

As for the *general dry-goods jobbing trade*, we find that there were in operation in 1912 thirty concerns, only two of which were located in New York City, the former general dry-goods jobbing capital of the country. Chicago in volume of business is now the leader although there are only three concerns in Chicago which belong to this class. St. Louis comes next in order in volume of business, with five houses which clearly belong with this group. In addition to these two chief centers of general dry-goods jobbing, there are such cities as Kansas City and St. Joseph, Cincinnati, Louisville, Indianapolis, and Pittsburg, in which are located practically all of the remaining general dry-goods jobbers. Generally speaking, it may be said that practically all of the general jobbers now left are located in the Mississippi Valley, with only a very few in the Middle Atlantic states, and none at all elsewhere.

Of the *specialty jobbing houses*, selling woolen goods among other lines, the directory gives us a total of 180, 98 of which are located in

[1] Adapted by permission from P. T. Cherington, *The Wool Industry*, pp. 142–48. (A. W. Shaw Company, 1916.)

New York, and 38 more within a radius of two hundred miles of New York City. The remaining 44 are located mainly in the Upper Mississippi Valley, western New York, western Pennsylvania, and Eastern Ohio. The growth of ready-to-wear lines and the development of knit underwear have been two of the most important influences bringing about the growth of a specialty jobbing business. The history of one after another of the most successful of the specialty jobbers shows that the start was as an offshoot from an old general dry-goods jobbing house, building up a business with a line of knit underwear as a nucleus for trade. In this way, line after line of the general trade has been split away from the old general dry-goods jobbing type of organization, and the lines which have been left naturally gravitated into the hands of specialized houses.

The *local general jobber* is the third general arbitrary classification chosen. It is difficult to draw a sharp line between the more important of these and the smaller general dry-goods jobbing in the first group. Taking the general nature of their available market, however, and the approximate geographic extent of their trade as the principal basis for division between these two groups, we find 75 houses which may be classed as local general jobbing houses. Of these, 49 are in the upper Mississippi Valley, at such railway centers as Columbus, Ohio, and in the central South, at such points as New Orleans, Memphis, and Birmingham, and on the Pacific Coast, notably in San Francisco. One curious feature of the distribution of these houses is that in the area easily accessible to New York, this type of house scarcely exists at all, the main exception being in the outer edge of this region in such districts as western New York or northern Virginia.

The fourth group, designated as *small local jobbing houses*, is distinguished from the group of local general jobbers mainly because their market area is smaller, and their total volume of business less. The matter of location has also been a factor in classifying houses in this group—those located at the minor railroad centers generally being placed here rather than in the local general jobbing-house group. The small local jobbers who include woolens among their lines number 205. Of these, 64 are located in the southeast and in the Virginia and North Carolina section, and 65 in the central South and in the Southwest, thus making 119 located in the southern district, or about 63 per cent of the total number. The remaining houses of this kind are scattered through every section of the country. While they are not as numerous in the districts easy of access to the large jobbing centers, they figure everywhere as an important feature of the trade.

There are a few *catalog jobbing houses* which have come, within the last few years, to figure conspicuously in the dry-goods trade, although most of them have come into the dry-goods business rather incidentally, and not as a part of their original plan. Butler Brothers, of Chicago, The Baltimore Bargain House, of Baltimore, and Charles B. Rouse of New York all conduct a certain amount of dry-goods business in this way, and perform what many country dealers have come to feel is a valuable service in offering to them at least staple lines on a mail-order basis.

Within the last few years there has grown up, in the Middle West particularly, a new type of wholesale house, dealing mainly in fabrics and known as a "*drop shipper.*" This type of house possesses no warehouse facilities, and is really an order-taker. It works mainly among the medium-sized department stores. The method of operation it employs is to solicit orders from samples and then to have these orders in carload lots sent to some convenient distributing point at the carload net rate, there breaking the car into smaller lots and securing a minimum freight cost from the factory to the store. It also cuts down all storage charges, reduces handling charges; and by offering comparatively full lines is frequently able to give better than regular wholesalers' prices to stores able to buy in case lots.

These changes in the organization of the wholesale dry-goods trade clearly cannot be attributed to any one simple cause. Underlying the whole process of reorganization are such large phenomena as the opening of the West, the drift of population westward, and the betterment of transportation facilities. Neither the changes within the wholesale trade nor those which have been mentioned as supplementary to them, such as the growth of large-scale retailers and the development of the ready-to-wear clothing industry, can be adequately explained without a consideration of these larger and perhaps more remote causes.

11. LONDON AND NEW YORK AS FINANCIAL CENTERS[1]

In considering the possibility of New York being a successful rival for supremacy as the exchange and financial center of the world, we can do no better than review some of the principal reasons why London has hitherto held that position, and it will be realized that

[1] Adapted by permission from E. L. S. Patterson, "London and New York as Financial Centers," *Annals of the American Academy of Political and Social Science*, LXVIII (1916), 264–77.

New York must duplicate these conditions in great part if not in entirety before London can be dethroned. These reasons and conditions can be tabulated briefly under three headings, physical, psychological, and economic.

1. *Physical conditions favorable to London.*—London is situated on the threshold of Europe in the heart of the world's commercial activities, directly opposite the estuary of the Scheldt and nearly opposite that of the Rhine and is within a short distance of every important exchange center in the world with the exception of New York.

London has the advantage of ice- and fog-free water lanes to every large port in the world with the exception of New York; the climate is equable and liquid, and perishable goods run little or no danger of freezing in winter.

The restricted insular area of Great Britain, a little larger than the state of Minnesota, is also an important factor, as it not only affords an immense seaboard compared with its size, but concentrates the population. A frequent and rapid transit service makes Great Britain practically one large city with London as the business center. Every bank in the country has a branch or correspondent in London, carries its reserves there and clears direct with every part of the country through its London agent. The economy of resources effected by this natural concentration of funds is seldom realized and is worthy of study. This insular position of London renders it comparatively free from the danger of invasion and seizure by a hostile power, and this immunity has been a factor in making London a world-depository.

The geographical situation of Great Britain, coupled with her willingness to invest money in international utilities, has placed her in a unique position as regards mail and cable facilities. Through her immense mercantile navy London has direct communication by fast steamers with every important port in the world and consequently acts as a foreign-mail clearing-house for all other countries. If French, German, or Dutch steamers afford a faster service to any point they can be utilized with little or no loss of time.

As Great Britain owns and operates two-thirds of the submarine cable mileage of the world, it is natural that London should be a great cable center with practically direct communication the world over. This service is now supplemented by a far-flung system of wireless stations. Furthermore, under normal conditions, every main

railroad on the continent of Europe gives its best service and equipment to its London mail train.

In dealing in foreign exchange and stocks London is the center of the world as regards time. She knows the conditions in Eastern markets before they close and is open long enough to operate in New York before her own markets close. Her position is therefore pivotal as regards time and distance.

2. *Psychological conditions.*—Perhaps a better heading than this would have been national characteristics. Great Britain is a land of slowly acquired fortunes, and the banker and merchant there are content with small profits and slow returns. They have long realized the fact that trade follows the loan and have therefore been willing to invest money in foreign countries with no prospect of recovering immediate returns or large profits, and the financing of these loans abroad has been an important factor in making the London money market so supreme. It is doubtful if the American is adapted temperamentally for operations of this kind or for the small profits of the exchange operations connected therewith. The United States has still a vast area in proportion to its population, its natural resources are not yet fully developed, and it is a country of large and rapidly acquired fortunes. It will, therefore, be many years before the investors and entrepreneurs are forced to direct their attention to foreign fields.

London's supremacy is the cumulative result of numerous forces, political as well as economic, spread over a long series of years during which time the world has learned to think in terms of British money, and the bills of exchange on London have been raised almost to the dignity of an international currency, while the safety of the Bank of England and the value attached to the word "sterling" have become proverbial. Sovereigns and to a great extent Bank of England notes pass current the world over without recourse to money changers. The dollar and the dollar bill must be made equally well known and acceptable.

It must not be overlooked that, when an international business is so long established and well centralized as the money market of London, the world will continue to use it as a matter of convenience irrespective of the possibly superior facilities of New York. The financial roads to London are well defined by much travel, and business tradition will favor the old stand; it is human nature the world over to follow the cow track across a pasture no matter how oblique its direction.

3. *Economic factors*—The principal economic factors which tend to enhance London's position as a financial center may be considered under the following heads: Free Gold Market; Liquid Discount Market; Stability of Money Rates; Immense Mercantile Navy, Great Foreign Export and Import Trade; Tariff; Excellent Banking System at Home and Abroad; the Numerous Branches of Foreign and Colonial Banks Established in London; Freedom from Panics and Financial Disturbances; Free Navigation Laws; Marine Insurance, etc.; and reliable Ship Registration.

Great Britain adopted the gold standard unequivocally in 1816, over one hundred years ago, and has not departed from it since, even to the extent of charging a fractional premium on gold or by restricting its export by legal or sentimental embargoes.

The national complement of a free gold market is a liquid money market capable of absorbing bills of exchange to an almost unlimited amount. This unique feature of the London market makes a first-class bill of exchange on London as acceptable as gold. The strength and broadness of the London market, apart from the natural resources of the country, lie in the ebb and flow of foreign capital through the machinery of the branches of foreign and colonial banks established there.

The absence of a tariff in Great Britain except on a few specific articles is of great importance, as merchants and others import into Great Britain free of duty and export again at their convenience. London and the other important seaports of Great Britain correspond to the freight yards at railway centers. Cargoes consisting of goods of every description pour into these ports from all parts of the world and are there sorted into mixed cargoes to be dispatched to various countries. In other words London also acts as a clearing-house for cargoes.

Large amounts of British capital have been invested in the establishment of British banks in her colonies and in foreign countries with head offices in London, and these render invaluable assistance in the operation and preservation of British foreign trade and commerce.

Great Britain possesses a mercantile navy second to none in the world. This not only means an immense toll on the world's commerce in the way of freight, etc., but also enables Great Britain to govern to a great extent the destination of cargoes. Incidentally, with her large ship-owning, Great Britain is naturally interested in marine insurance, and owing to the excellent standing of her insurance companies does an immense business in foreign marine insurance.

British navigation and shipping laws are liberal. A foreign ship is in the same position as a British ship with regard to British trade, and foreign ships engaged in the coasting trade are not subjected to higher port rates than British ships. British law affords equitable protection to both British and foreign seamen, but avoids emasculating the service by undue paternalism.

We have now reviewed briefly the principal reasons to which London owes her financial supremacy and though the events of the past few years have brought New York into a position of financial eminence and power, it remains to be seen how much of this power has been thrust upon her temporarily and how much she has acquired permanently at the expense of London.

B. Factors Determining Location in Sub-Areas—Site Location

The preceding discussion has been directed toward answering the question: Within what broad area, or areas, may a given plant be appropriately located? There still remains the determination of the proper site within such area. It will be found (see Selections 12–13) that there is geographical specialization by small areas and that this may be explained by the same general principles which explain specialization in terms of broader territories. But even within these small areas a specific site must be chosen and we must consider (see Selections 13–16) the factors determining this choice. These matters lead very naturally to a discussion (see Selections 17–19) of the relative merits of city, country, and suburb as locations for industrial plants.

PROBLEMS

1. "Eventually, in the largest cities, the subdivision of certain sections is highly developed. The distribution of different sections depends upon (1) topography; (2) prior establishments; (3) transportation; (4) effectiveness of the demand of different utilizations; (5) their relation to one another." Explain the significance of each item.
2. "The financial section which is of marked importance only in the largest cities, is generally to be found at or near the starting-point, or the original center of gravity, and is hard to move." Explain.
3. Why does the relative significance of corner lots vary with different industries? Can you lay down any general principles governing the matter?
4. Enumerate forces tending to group businesses in particular streets; tending to disperse businesses. What businesses in each case?
5. Do you know a city in which there is an "automobile row"? Why is it located as it is? What other industries are grouped near it?

6. "The greater the number of passers-by, the greater is the value of a site for retail establishments." Is the statement strictly true or are there certain exceptions?
7. In a general way what classes of stores follow the growth of a city into its suburbs and what ones stay at its business center?
8. "Wholesale trade is likely to be centralized; retail trade is likely to be decentralized." Why or why not?
9. "Effective competition in retail trade sometimes requires concentration, sometimes dispersion of business." Explain.
10. Draw up a statement of general principles with respect to the location of retail establishments.

11. What is meant by saying that a factory site should be selected in terms of the proper routing of materials in manufacture? in terms of equipment to be used? in terms of an appropriate type of building?
12. "The entire planning should be for an ultimate plant even if a dozen times the size of that to be immediately constructed, and land purchases should be made on that basis." Give reasons for and against.
13. How much weight do you give to "salability" in locating a plant? As much for a factory as for a retail store? Assume any given business and list as many factors as you can which will affect salability.
14. What is meant by saying that it is desirable so to locate a plant as to secure advertising value?
15. "The city location has the advantage: first, for the manufacture of specialties depending upon fashion, of goods for immediate consumption, or requiring considerable supervision by the selling department over the manufacturing department, where nearness of market is necessitated by the nature of the product; second, when a special advertising and selling advantage will accrue to the sale in the city where the factory is situated; third, when skilled labor is required intermittently or in large quantities; fourth, where the product is shipped in less than carload lots." Explain what the writer has in the background of each of these statements.
16. "If it were left to the selling organization to choose, there is no doubt that in ninety-nine cases out of a hundred the factory would be located in a large city." Why, or why not?
17. "A rigid and inflexible street system in a city handicaps a factory." How?
18. "Adequate provision for schools, libraries, and civic institutions may be of business value to the suburban plant management." How?
19. "The city location has always one advantage. The city is the battlefield of business." Is this worth much?
20. Cite instances where low tax rates or freedom from taxation may result from causes which would put an unendurable burden on a business in other respects. In general terms when are low taxes a safe attraction?

21. "Perhaps the greatest single factor in promoting the bad location of producing enterprises is local patriotism." Explain.
22. If X lot will save a manufacturer $1,000 a year over Y lot because of its better facilities for handling, shipping, or storing goods, how much more can the manufacturer afford to pay for it?
23. "Mechanics of the highest skill or specialized training avoid the isolated plant for definite reasons." Give some of these "definite reasons."
24. "In some cases the facilities for quick and economical construction are the crucial considerations." Why quick?
25. "A site in the city itself will generally be too costly for all but light manufacturing." Do you agree?
26. What is the significance of settled and stable political conditions with respect to the location of industries?
27. Local ordinances need to be considered, particularly in large cities What matters are thus affected?
28. "The impulse toward cheap land, low taxes, and elbow-room are centrifugal forces throwing industries out from the large centers of population. Centripetal forces bind them as satellites beyond the outer rings of the mother city." What centripetal forces? Give some examples of satellite cities.
29. Is such an enterprise as Gary worth while as a means of escaping labor problems? Give detailed reasons in support of your answer.
30. Does the suburban or country location increase the social responsibility of the business manager? How?
31. List the factors for and against country location (as opposed to city location) as regards (*a*) labor, (*b*) material, (*c*) markets, (*d*) social environment.
32. "The smaller an establishment the more significant is the question of location to it. The large concern can be more self-contained." Do you agree?
33. Could a large bakery wisely be established in a small town? At what general principle is the question directed?
34. Draw up an outline of the main points in this section. Does your outline show cases of the manager's relationship to the physical environment? to the social environment? to risk-bearing? to personnel? to finance? to the market? to technology? Are there evidences of interdependence in these relationships?

12. GEOGRAPHICAL SPECIALIZATION BY SMALL AREAS AND THE SECTIONS OF CITIES[1]

Every city has a definite structure which, expanding more or less regularly along the lines of least resistance, is subject to modifications by external influences. The study of the ground plan of any city

[1] Adapted by permission from C. C. Evers, *The Commercial Problem in Buildings*, pp. 17–22, 83–86. (The Record and Guide Company, 1914.)

will enable us to ascertain the lines of communication with the exterior, the main arteries of internal traffic, the subordinate streets, the distribution of the different sections, and their relation to one another.

As cities grow, they become more complex and their subdivisions more numerous, and at the same time these assume more distinctive characteristics; numerous residential sections spring up, attracting people of different tastes. Business sections of established character tend to attract industries and occupations similar to those already located there and to repulse others. The addition of new territory disturbs the center of gravity and adds its influence to the other elements impelling changes.

The following list comprises the most important sections and indicates their uses: *residence*—(1) highest class residential, (2) general residential sections, (3) tenements or cheapest dwellings; *business*—(4) financial and office section, (5) high-class shops (general shops and department stores), (6) other and local shopping centers, (7) wholesale and commission, (8) warehousing, (9) factories, etc.

The financial section, which is of marked importance only in the largest cities, is generally to be found at or near the starting-point, or the original center of gravity, and is hard to move.

The highest class residential sections are established on land of moderate elevation, free from nuisances such as the noisy traffic of street-car lines. They attract high-class shops which endeavor to be as near as possible to their customers; they also attract churches, theatres, clubs, and similar attendant buildings.

The medium-class residential sections are also attracted by land of moderate elevation, but depend to a greater extent on good transportation, and to a lesser degree on absence of nuisances. They also cause the establishment of local shopping streets and create a demand for churches, theatres, clubs, etc., for the use of their occupants.

The cheaper dwellings or tenements utilize land in proximity to factories, warehouses, and shops, which are often intermingled with buildings used as dwellings; others form dense settlements along transportation lines. Every improvement in transportation tends to strengthen these outlying settlements, whose inhabitants are willing to spend the extra time necessary to reach their employment and to pay the cost of the daily journey in return for cheaper rents and less crowded conditions.

Shops catering to local trade follow and press on the different residential sections, whilst those general shopping sections which serve a larger territory are dependent to a greater extent on transportation which is necessary to bring their customers to them and they tend to concentrate in central locations. The largest shopping sections create a demand for light manufacturing establishments, warehouses, and stables or garages in their immediate vicinity.

Commission and wholesale houses, which draw their trade largely from the surrounding country and are only partially supported by local buyers, congregate in sections which are accessible to their customers and where they have proper transportation facilities for the delivery of their goods.

The location of warehouses and factories is governed by the need for cheap land and access to transportation lines.

The less desirable lands are frequently used for the storage of articles of large bulk, like coal, stone, brick, and lumber.

The location of these different sections and the areas they cover is constantly shifting, some of them offering greater resistance to changes than others. There exists a constant tendency to the displacement of one class of utility by others which can pay higher rentals, especially when their presence is detrimental. For instance, the advent of shops in the high-class portions of Fifth Avenue, New York City, has caused the steady northward movement of Fifth Avenue residences, with which all New Yorkers are familiar.

Distribution of different sections.—The distribution of different sections depends on: (1) topography; (2) prior establishment; (3) transportation; (4) effectiveness of the demand of different utilizations; (5) their relation to one another.

13. THE LOCATION OF RETAIL ESTABLISHMENTS[1]

The possibility of making sales depends upon accessibility to the purchasing public. The greater the number of people, other things being equal, who live near, who come to, or who pass by a certain location, the more valuable that location is. Every retailer who knows his business recognizes this. The president of the Woolworth five- and ten-cent-stores company expressed this idea exactly when he said, "I set my traps where the mice are thickest." Store managers, particularly the managers of certain chain-store systems, on seeking

[1] Adapted by permission from P. H. Nystrom, *Economics of Retailing*, pp. 138–53. (The Ronald Press Company, 1915.)

out new locations for stores, first determine the number of people who pass the proposed locations, actually counting them for certain periods of time often for weeks, so as to get accurate data and then give their preference for store location to those places—other things being equal—that show the highest counts.

The neighborhood store aims to get as close to the homes of the prospective customers as possible, so that it will be easy for them to come to the store or to send for goods by means of children or servants, and so that deliveries can be made quickly. But neighborhood stores must as a rule content themselves with handling only such lines of goods as are of daily necessities in the surrounding homes, such as groceries, meats, baked goods, and dairy products. Another limitation on a neighborhood store that is clearly evident is that its area of trade is limited. Hardly ever does trade for such a store come further than four or five blocks. Beyond this radius the influence of competing neighborhood stores or the attraction of the stores in the center of the city overpower the trade possibilities of the neighborhood stores.

In considering the value of a location for a retail store, however, something more than the number of passers-by must be taken into account. The purchasing power and the probable proportion of customers from the passing crowds are most important considerations. Hence in analyzing a location for a retail store, one must determine what economic classes are represented, to what extent in each, and what their buying habits are.

Another classification of passers-by that will prove helpful in determining an estimate of the possibilities of a location is based on the purpose or the reason for their passing by. Some are going to or coming from their place of work or business. Others are out for pleasure. Others are out to buy, while others are out merely to look.

Passers-by going to or returning from work or business are, as a rule, not good customers for anything, with the one exception of the higher-salaried and income-receiving classes who patronize newsstands, bootblacks, barber-shops, cigar stores, and, to some extent, haberdasheries on their way to and from business. Large crowds of factory employees, men and women, may pass a store day after day for years on their way to and from work and never patronize it. On their way to work there is usually little time left before the whistle blows; hence there is usually little or no chance to look at goods. On their way from work they are usually tired and hungry and not in

the mood for shopping. Many factory workers, particularly of the younger generation, do not care to trade in a store or in a part of town where their occupation is known or where any reference may be made to their daily labor. The "downtown" retail district is much more likely to draw their trade. A very large part of the goods of all kinds needed by the family from which the factory worker comes is purchased by the wife or mother, and thus the trade goes to the locations that are the most convenient or attractive for her. The only classes of retail business that seem to do well on the custom of working people going to or coming from work are, too often, the saloons and the cheaper grade of restaurants and lunch counters.

Pleasure seekers are usually better buyers than the army of workers passing to or from work. Refreshments, flowers, sweets, souvenirs, and trinkets are some of the objects that may appeal to their fancies. Such trade is strictly chance custom. It is entirely dependent upon the time of year, the occasion, and the weather.

The people who come out for the express purpose of shopping and buying are for the majority of retail businesses by far the most important classes. The places to which these people go are the places that are valuable for retail purposes. Except for such necessities as common foods, meats, and so on, the place to buy, according to the opinion of the shoppers, is nearly always in the heart of the town. This may be the location of the village corner store, the big stores at the intersection of the principal streets in the city, or the place where the great public markets are located. Here, in the mind of the average customer, are offered the biggest variety, the best qualities, the best facilities for examination, and the biggest bargains.

Stores tend to cluster around this best location in the city and to form what is known as the retail district. The stores established are not always competitors. Almost as frequently they arrange themselves into complementary groups co-operating with each other in the attraction of custom and in the making of sales. Thus, stores dealing in men's goods are sometimes found on one side of the street, while stores dealing in women's goods are located on the other side. Dry-goods, millinery, jewelry, shoe, and book stores are likely to be found close together, if not entirely absorbed under one roof, in the form of a department store. Grocery stores, meat markets, and bakeries tend to form another grouping, each co-operating in a way with the other kinds of stores in the group. Confectioneries, soda and ice-cream parlors, florists' shops, and theatres form another natural

grouping. The saloon, billiard hall, tobacco and news-stand, and the cheaper grade of restaurants form still another.

But stores that sell exactly the same kind of goods and that are clearly competitive do not necessarily merely divide the business that was formerly done by one store. When there is known to be competition, this in itself attracts trade, and people come from farther away. New wants are developed that did not exist before. Thus the result is an increase in the total amount of trade. Stores handling the same or similar lines and stores handling different lines of goods, all close together, save the customer's time. This is probably the greatest argument for the department store, which assembles many lines under one and the same roof.

Most customers, particularly women, like to compare values in different stores before purchasing. An investigator for a large publishing house has stated that "before she buys, a woman usually visits three stores to compare goods. The man, who is distinctly 'anti-shop' in his inclinations, on the contrary visits but one." Competing stores, located close together and dealing in goods women buy, permit comparisons to be made easily. A location next to a large, old, well-advertised, well-known, and popular store is always valuable for another store dealing either in complementary or competitive lines of goods.

We have so far considered the possibilities of a retail store location from the standpoint of the number of passers-by, the buying power represented, and the purposes that bring them by. There is another factor having an influence on the value of a location and that is the buying habits of the possible customers. Not all people within even the same economic classes, or those having the same incomes, expend their money in the same way. In nothing is this more clearly exemplified than in lines commonly called luxuries. Some people spend their money freely for such items, while others with the same income do so sparingly. The average consumption of such commodities varies greatly from one community to another. In this connection it may be noted that tastes and habits are neither stationary nor permanent.

Any influence on the course of people's movements affects the value of a retail location. Certain streets are more popular than others, and one side of the street is generally more traveled than the other, with a consequent difference in value for retail purposes. One must assume that there are definite reasons for this, and upon the

basis of these reasons the retailer must select his location or make the best use of the one already selected.

Sunlight and temperature tend to make one side of the street more crowded than the other. In warm climates and in warm weather people seek the shady side. In colder climates and in the winter-time they walk the sunny sides. Which side of the street is most popular must depend therefore upon what time of the day shoppers come out in greatest numbers.

The shady side of the street has an advantage. Because of the reflection of softer lights from the plate glass and show-window backgrounds on this side, the window displays appear to better advantage and therefore draw more attention. Also a greater variety of goods can be shown and much better effects can be obtained on the shady side of the street than on the sunny side because of less danger to the goods themselves from the effects of the sun. Goods of delicate shades generally fade easily and need protection from the sun's direct rays. In order to display such goods on the sunny side awnings are necessary, but awnings interfere with the widest and best use of the front of the building and windows, and hence may be considered in the light of necessary evils only.

In some places there are generally prevailing winds that strike certain locations or one side of certain streets in a more disagreeable way than the other side, causing values to be less on the exposed side. Dusty and windy locations are never desirable if they can be avoided.

If a town is built on a sidehill, the upper side of the street is nearly always preferable to the lower. The reason may be that the upper side gives a better view, or it may be that it is less laborious to go from the upper side to the lower side, if necessary to cross the street. Dust and refuse tend to gather on the lower side of the street, with the result that the upper side is generally cleaner. Whatever the cause, the fact remains that the upper side seems to be favored in most cases. This tendency may be remedied to a certain extent, but not entirely, by having the streets graded so as to put the walks on both sides on the same level.

Often the only explanation for the value of a side of street for business purposes is popular habit. People continue to take one side rather than the other because sometime in the past they found it best to do so. After the reason for so doing passed away, the practice continued as a habit.

See also p. 64. Geographical Specialization by Small Areas and the Sections of Cities.
p. 319. Some Phases of Market Analysis.

14. SITE LOCATION CONSIDERATIONS[1]

The beneficial or detrimental effects of surroundings or external conditions on different classes of buildings may be summarized as follows:

Financial and office buildings.—Very great excess in value of corner over interior lots on account of permanent light, increased available accommodation, large frontage for advertising, and greater accessibility.

Beneficial	Detrimental
Similar surroundings	Poor or dissimilar surroundings
Ease of access from other sections of the city	Difficult access from other sections
Accessibility to principal financial institutions, banks, exchanges, clearing houses, etc.	Distance from main financial institutions
Compactness	Noise of elevated railroads
Ease of intercommunication	Noisy or unpleasant factories or plants
Absence of severe grades	

High-class general retail shops and department stores.—Great excess value of corner over interior lots, especially at the intersection of two or more traffic streets, mainly on account of the increased opportunities for display and the intensity of passenger traffic on these streets; partly on account of better light; they attract loft buildings for light manufacturing or for finishing processes, which locate as near them as possible.

Beneficial	Detrimental
Good frontage on traffic streets for display	Frontage on non-traffic streets and too small area for proper display of goods
Good transportation facilities	Poor transportation facilities
Continuity of display windows of other shops	Nuisances, such as irregular building line, schools, vacant unimproved lots, factories, stables
Nearness to the best residence sections	

[1] Adapted by permission from C. C. Evers, *The Commercial Problem in Buildings*, pp. 83–86, 259. (The Record and Guide Company, 1914.)

Beneficial	Detrimental
Good streets and sidewalks	Lack of continuity of shop fronts
Absence of severe grades	Poor access from residential sections
Good access from residential sections	
Sufficient area for proper showing of goods	
A rear or side street for the delivery of goods (in some cases, especially department stores)	

Small local retail shops.—Corners more valuable than interior lots on account of increased opportunities for display and light; proportion depends largely on value of traffic on intersecting streets.

Beneficial	Detrimental
Proximity to customers, who generally are those residing in vicinity	Inaccessibility to customers
Car line on street	Frontage on non-traffic streets
Good frontage for display more important than large area	Lack of continuity
Maximum depth necessary, about fifty or sixty feet	Too long blocks, too long street crossings at corners
Continuity of shops, but not too long blocks; if blocks are too long they are weak at center and receive a smaller proportion of passenger traffic for a given frontage	Poor transportation facilities
	Bad paving and sidewalks and dirty streets
Good paving and sidewalks and clean streets	Nuisances, such as factories, stables, etc.

The best local shopping street is generally found to lie as nearly as possible through the center of the district which it serves; its strongest part will tend to be near the center of gravity of the section.

Wholesale or commission buildings.—Corner lots do not greatly exceed interior lots in value. Sufficient floor area for displaying and storing goods more important than frontage. Goods generally advertised to a greater extent by commercial travelers than by street display.

Beneficial	Detrimental
Sufficient area for storage and display of goods	Lack of sufficient area for display and offering of goods
Ease of access	Distance from transportation facilities
Light (in some cases)	Poor street improvements and heavy grades, increasing cost of hauling
Proximity to high-class retail stores when custom is with them	
Proximity to freight transportation facilities	
Location amidst similar utilities	
Good and level streets for hauling	

Warehouses.—Corners of practically the same value as interior lots, except where light is needed for inspection of goods. Frontage on street of small importance compared to required area. Deep lots give cheaper rentals.

Beneficial	Detrimental
Nearness to steamship or railroad facilities	Lack of transportation facilities
Level and well-paved streets for hauling	Shallow lots
	Difficult access, heavy grades, and poorly paved streets

Factories.—Corners of same value as inside lots, except for light. Land of cheap value and nearness to transportation facilities chief requisites. For light manufacturing, proximity to large retail stores which they serve.

A word should be said concerning the difference between corner lots and inside lots for various purposes. The greatest difference between inside and corner lots occurs in business property at the intersection of two traffic streets, or where property has its long frontage on a business street. The only satisfactory way to estimate the value of such plots is by capitalizing the net rents, less the interest return on the cost of the building. The following table shows, in terms of percentages, the approximate difference in value of corners over inside lots in different classes of property.

	Cheap	Medium Class	High Class
Detached residence property	Any difference in value offset by the extra cost of street improvements	5 to 10	10 to 20
Attached residence property	10	20 to 30	10 to 50
Apartment houses	15 to 20	25 to 50	50 to 100
Tenements	15 to 20	25 to 30	30 to 40
Small shops and flats	20 to 25	25 to 50	.....
Stores and offices	.....	40 to 50	50 to 150
Financial buildings	.....	.....	50 to 100
Wholesale and commission	10 to 15	.....	15 to 20
Warehouses and factories	Little, if any, except in high factories, where it may be 10 to 20	.....	.....

15. AN OUTLINE OF THE RELATIONS OF TRANSPORTATION TO SITE LOCATION[1]

[This material is presented not only because of its own subject-matter but also because it indicates a possible method of attack upon other phases of site location.]

A. Transportation

1. Railroads (freight problems)
   - *a*) Quantitative requirements
     How important a matter is rail transport to you?
   - *b*) Qualitative requirements
     What type of service do you demand?
     Is a private siding necessary?
     In what directions must your goods travel and what roads are required for this?
     Is your business large enough to make you independent of any one road or would it be best for you to secure a plant site which would give you a choice of lines?
   - *c*) What sections of the city would best meet your needs in this particular?

2. Railroads (passenger problems)
   - *a*) Quantitative requirements
   - *b*) Qualitive requirements
     What type of service is demanded?
     In what direction is the greatest amount of travel?
     Where are the passenger terminals which drain this territory located?

[1] Adapted from an unpublished manuscript by F. M. Simons, Jr., Manager of Industrial Engineering Department, Arthur Andersen and Company.

3. Waterways
   a) Quantitative requirements
   How important a matter is water transportation to your industry?
   What type of transportation is most important and to what degree—lake, river, canal?
   b) Qualitative requirements
   What type of service is demanded?
   In what direction must your water traffic flow?
   What (and in each case specify, lake, river, canal) water facilities best meet your requirements and where are these facilities to be found?
   c) What sections of the city best meet your requirements in this particular?

4. Electric
   a) Quantitative requirements
   How important a matter is this to your plant and why?
   b) Qualitative requirements
   What type of service do you demand—surface, elevated, interurban?
   From what parts of the metropolitan district (or surrounding territory) do you recruit your labor?
   Is your industry such as to allow a wage sufficient to permit of carfare or must you seek the labor in its home?
   What parts of the city best meet these requirements?
   c) What sections of the city best meet your requirements in this particular?

B. Street communication

1. Cartage and drayage
   (Study this in connection with your transportation problem. It may be that a wise selection of plant site would wipe out the cartage problem)
   a) Quantitative requirements
   How important a matter for your plant and why?
   b) Qualitative requirements
   What type of service does your business demand? For example, what weight and bulk of article must be handled and what is the effect of this on your problem?
   How fragile or perishable are your raw materials or products?
   What is the resultant effect?
   c) What is the resultant of your cartage and drayage problem?
   d) What sections of the city best meet your needs in this particular? Paving and road conditions and street congestion problems confront you here

2. Street conditions affecting movement of persons; pavements—their condition and width. Consider this matter under headings indicated above, remembering that for a large plant this may be an important detail

16. THE INTERDEPENDENCE OF CONSTRUCTION AND EQUIPMENT WITH SITE LOCATION[1]

The following is a classification of the work incident to the planning and building of industrial plants down to the time of definite site location.

P = PRELIMINARY SERVICE

P *a* Determination of specific manufacturing requirements and compilation of data relating to present and future needs.

P *b* Determination of fundamental principles that will be followed in new plant regarding the administration of all manufacturing details.

P *c* Consideration of features exemplified by plants recently built for essentially the same class of work.

P *d* Determination of kind and amount of machinery that should be provided for immediately.

P *e* Determination of geographical location of site and whether plant should be built in business center or suburban section.

P *f* Determination of approximate arrangement of equipment and processes based upon elemental routing and administration requirements.

P *g* Determination of floor areas required for manufacturing departments, storage departments, assembling departments, offices, etc. Also for likely future requirements.

P *h* Determination of departments which must be accommodated on the ground level and which may go on upper floors.

P *i* Determination of railroad and trucking facilities that should be available for receipt and shipment of materials.

P *j* Determination of total property area needed at once, and amount that should be reserved for the future.

A tabulation should now be made of the areas necessary for different classes of work, for storage, and for all other purposes including yard requirements, the immediate and future needs being segregated. The open and enclosed areas should be totaled separately, and a note made of the enclosed floor space that does not necessarily have to be upon the ground floor. With all the foregoing data at hand, a

[1] Adapted by permission from Charles Day, *Industrial Plants*, pp. 19–30, 46–48. (The Engineering Magazine Company, 1911.)

fair opinion can be reached concerning the shape of property that should prove most desirable.

The considerations have so far been based upon the assumption that an ideal property can be had; and this is as it should be, for the site should be selected with a view to attaining as nearly as possible to such an arrangement. Of course the procedure is somewhat different if the location of the new plant is fixed in advance, as actual conditions must then be taken into account from the start with a view to minimizing apparent disadvantages. The remaining subdivisions of our preliminary service have to deal with the selection of the property finally determined to be most suited to our circumstances, and the final disposition of the building and equipment features.

P *k* Selection of property that most nearly meets the requirements dictated by study of the foregoing factors. If possible, it is preferable to defer purchase until completion of preliminary work.

Usually a number of sites are found to possess certain of the essential requisites, although each may fail to comply in some particular with the ascertained requirements. Consequently, several properties are frequently taken under consideration pending the completion of definite layouts, building sketches, and estimates of total cost.

In order to make the best selection of property for an industrial plant, all the data bearing directly upon the desirability of the location for the business in question should be separately tabulated, and in this way the work will be greatly simplified through the ready elimination of undesirable sites. The essential data will, in most cases, comprise a knowledge of the character of soil for foundation purposes, expense that will be incurred to make the property available, cost of property, availability of water, coal, oil, gas, or other raw materials, sewers, and protection afforded by the locality against destructive fires, etc. It has been assumed that the decision previously reached as to geographical location has been based upon a knowledge of the desirability of the labor market, and the point best suited for the economical receipt of the materials or products upon which work is to be done and their final distribution to customers, and, of course, only such properties would be considered as afforded the requisite area.

If one property appears to be undoubtedly preferable to all others, the engineer can then proceed accordingly; but, as has been stated,

it is possible that he may wish to work up preliminary layouts for several properties before making the final selection. In this case, precise information should be secured concerning each site that is to be taken under serious consideration. First a survey should be made, preferably by engineers in the employ of the municipality or county in which the site is located, for their intimate acquaintance with the status of local surveys, deeds, and records is valuable. The "plat," as a survey is called, should give the property limits and elevations (at the intersection of suitable cross-section lines) which should preferably refer to established datum. The location and character of all buildings or other structures and railroad sidings existing on the property should be carefully recorded, as well as conditions of this character in connection with the abutting properties.

All sewers, gas pipes, and water pipes and openings to same, as well as all electric circuits (both overhead and underground) occupying the adjoining streets or crossing the property, should be indicated and their depth or height above the standard datum noted. The same plat should indicate the location of such test pits as are made in order to determine the character of the soil or wells that have been driven to ascertain the available water supply, and a note should be included calling attention to adjoining streams, if any exist, and to the nearest trolley system or railroad, if sidings are not available upon the property.

P *l* Preparation of alternate layouts of departments, segregating them into one or more buildings of assumed types, taking into account all the foregoing factors including the selected property.

P *m* Reconsideration of all work done so far and preparation of a revised layout incorporating as far as possible the best features of the various preliminary studies. Making outline drawings of buildings.

P *n* Preparation of a classified estimate of cost based upon unit prices.

P *o* Determination whether estimated expenditure would result in a "fixed charge" consistent with the probable profits of the business, i.e., can the business carry the necessary investment?

P *p* Determination whether owner is prepared to make the total justifiable expenditure.

P *q* Revision of layouts, if required by financial limitations (P *o* or P *p* or both), and placing data and plans in suitable form to be used as a basis for the preparation of architectural and engineering drawings and specifications.

17. CITY, SUBURBS, OR COUNTRY[1]

Consider the relative merits of the three classes of location open to the prospective manufacturer, namely, city, country, or suburban. Cities, being natural centers for trunk lines or water transportation, usually offer superior advantages for obtaining raw materials and shipping finished goods. An abundant labor supply is obtainable as compared to other localities. If the plant is small and dependent on other industries as, for instance, repair shops or some closely articulated industry, the city offers superior advantages when these other industries are present, as they usually are. It is often easier to finance an undertaking in the city, cities offering better fields for obtaining subscriptions to stock or obtaining special inducements to locate, such as exemption from taxes or even large cash bonuses to assist in starting the enterprise. If the plant is small and is supplying the local market alone, the city offers market advantages that would not be so important to a larger plant. A plant located in a city enjoys municipal advantages such as good streets, sewers, gas, police protection, fire protection, etc.

As opposed to these advantages the city location has the disadvantage that land is high priced, and it is very often difficult for large works to secure a site within a city where buildings exactly suited to the purpose desired can be erected without great expense; and if the city is a growing one the taxes in time make the location too expensive. This is one of the reasons why many factories have, within recent years, been compelled to move to the country or the suburbs. City restrictions regarding smoke and other municipal ordinances governing industry are questions that must be carefully considered. While labor may be abundant in the city, the cost of living and hence the wages paid are, in general, higher than in the country.

The advantages of a location in the country are not so numerous as those of the city, but they are often of paramount importance. Thus, if a water-power is obtainable or if a supply of pure water is necessary, as in paper-making, a country site may be very desirable. Land is cheap in the country and hence the factory can be built to suit the exact needs of the industry and ample provision made for growth. Taxes are low and restrictive ordinances not likely to hamper the activity of the plant. The larger the plant, the less it is dependent

[1] Adapted by permission from D. S. Kimball, *Principles of Industrial Organization*, pp. 227–34. (McGraw-Hill Book Company, Inc., 1913.)

on other industries and hence the country site, in general, appeals to the large operator more than to a small one. The local market is, likewise, likely to be of less interest to the large plant. Undesirable neighbors can be more easily avoided in a country location and the danger from fire and other hazards resulting from surrounding industries are also minimized.

On the other hand, the labor supply of the country is usually a troublesome problem. The city offers advantages and amusements to the working classes that cannot be had in the country. An effort is made to offset these attractions by building model factory villages where employees may acquire homes on easy terms and enjoy the healthful life of the country. Of course the employer who engages in such an enterprise must expect to feel a greater responsibility toward his employees than he would in a city where the bond is much looser. But such work as this is worth while, and no doubt the near future will see a great amount of decentralizing of industry from the thickly congested centers in favor of country locations. Just as it is difficult to induce labor to leave the cities, so it is difficult to attract them away from good country industries if the conditions of life are made attractive; and labor troubles are likely to be less in a country location than in a congested city.

The suburbs of many cities offer a compromise between the city and country and possess many of the benefits of both. Land can be obtained at a price far below city property, and trolley lines have made living in the suburbs cheaper than in the city and yet made it possible for the suburban dweller to take advantage of the attractions of the city. An examination of any of our large cities will show an immense amount of manufacturing in the suburbs, this location being particularly advantageous for fair-sized plants.

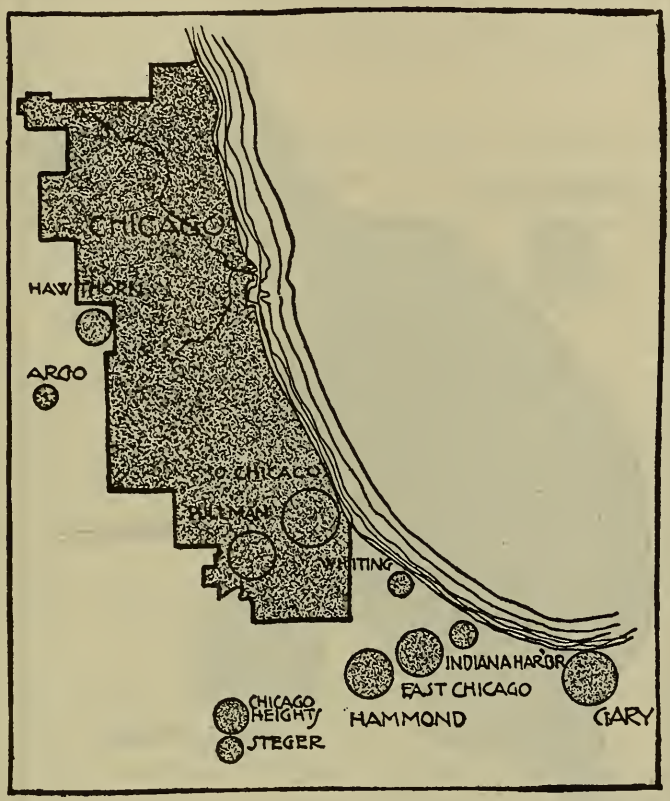
From the above it will appear that the city location in general offers greatest attractions to the small plant, the suburbs are best adapted to fair-sized plants, and the country offers by far the greatest attraction and fewest disadvantages to the very large plant, provided an adequate supply of labor can be obtained.

18. SATELLITE CITIES[1]

From the middle of Philadelphia, several departments of the Baldwin Locomotive Works have been shunted out into a small

[1] Adapted by permission from G. R. Taylor, *Satellite Cities*, pp. 1–14 (D. Appleton and Company, 1915.)

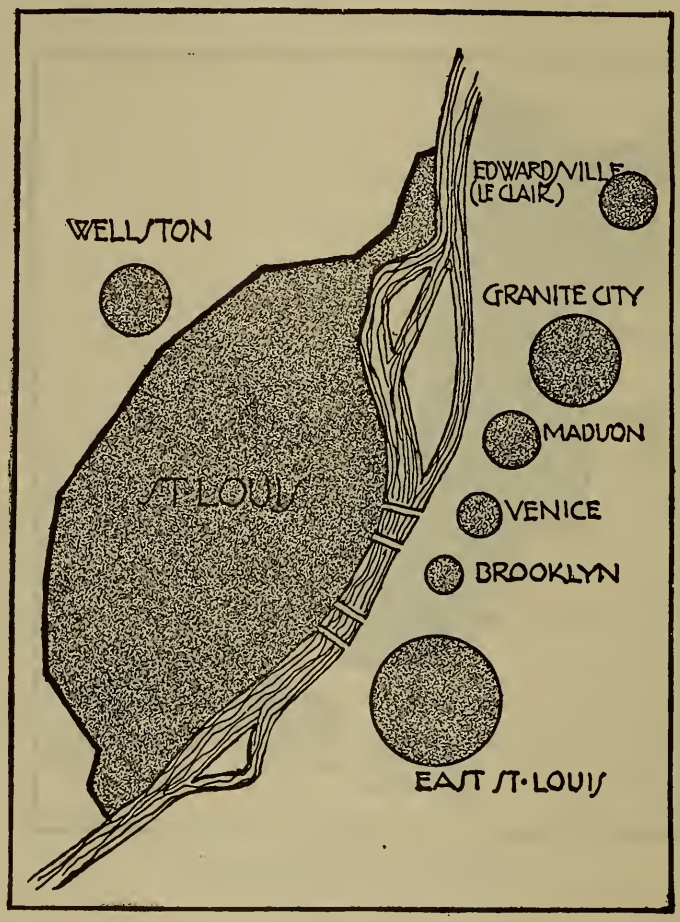
suburb. Flint, Michigan, two hours from Detroit, has been seized as the place for huge automobile factories. While the population was trebling in the first three years, several hundred operatives had to be housed in tents throughout one summer. A big corn-products plant moved from the middle of Chicago to the near-by prairies and a "glucose city," Argo, started up. It occupies part of a tract of ten square miles, which one promoting company is developing as an



CHICAGO AND SATELLITES

"industrial district" and into which Chicago has already emptied more than two dozen establishments. Just outside Cincinnati a residential suburb, Norwood, is now the home of a score of manufacturing concerns. Impelled partly by the arbitrary tolls charged on coal carried across the Mississippi River, industrial plants have moved over the bridges from St. Louis and founded a group of new towns in Illinois. The Standard Oil Company, a few years ago, poured out $3,500,000 on the bank of the Missouri a few miles from Kansas City, and the town of Sugar Creek sprang up. Yonkers long

since lost its staid old character in a smother of hat and carpet factories. The metropolitan manufacturing district stretches out in belts and flanges from New York into Long Island, Staten Island, and New Jersey, while eastern Massachusetts is a mosaic of mill towns. In some sections of the South scarcely a city of any size lacks one or more satellites thrumming with spindle and shuttle.



St. Louis and Satellites

Gary, with its population nearing 50,000, where in 1906 there were only rolling sand dunes covered with scrub oak, is thus seen to be but the largest and most spectacular example of the far-reaching industrial exodus. Far-reaching and fast-moving, for Gary had scarcely attained four-year-old dignity when work started on a still newer member of the United States Steel Corporation's brood of steel towns—Fairfield, first known as Corey, on the edge of Birming-

ham, Alabama. On the heels of Fairfield came the news that more millions and another plant would found another steel town near Duluth.

This industrial exodus from city center to suburb was first seen conspicuously in the establishment of Pullman and Homestead in the early eighties. These two places were by no means the only forerunners. South Omaha, for example, in 1883, sprang up around the stockyards at a railway junction so rapidly as to win the name "Magic City." These exceptional towns, suddenly created at the dictate of pioneer master minds of the new industrialism, thrilled the popular imagination.

Many reasons are readily apparent for the location of these new industrial communities. The impulse toward cheap land, low taxes, and elbow-room throws them out from the large centers of population. These are the centrifugal forces. The centripetal forces are equally powerful and bind them as satellites beyond the outer rings of the mother city. Even the towns which, like Gary, have attained a considerable measure of self-sufficiency and lie perhaps across state boundaries are bound by strong economic ties. Through switch-yards and belt-lines, practically all the railroad facilities developed during years of growth, which are at the disposal of a downtown establishment, are at the service of the industry in the suburb. It means much to be within easy reach of at least one large market for finished product. Proximity to a big labor market is a more important factor.

The census bulletin sums up the industrial exodus in numbers of manufacturing establishments, in value of products, etc. From the standpoint of the common welfare, it should be reckoned also in terms of citizenship and human values. What of health and housing? of leisure and income to make it count? of playgrounds and schools? of living costs? of city government, politics, and civic spirit?

There is a public challenge in the very fact that in these localities civic and industrial conditions are being created brand-new, on a wholesale scale, without the handicaps and restrictions which high land values and prior improvements impose on every effort to reconstruct the congested centers. Are we turning these advantages to account? In our general municipal development we pay more and more heed to the counsel of city planner, housing expert, and sanitarian. We struggle to reshape our rigid, old-fashioned

conditions to fit newer and more workable molds, just as the manufacturer has to tear out, rebuild, and build higher if he stays in the midst of congestion while his business expands.

But have we set ourselves to inquire whether these made-to-order industrial cities, involving living conditions for thousands of people, are so shaped at the outset? In the planning of the great suburban industrial plant, marvelous skill and foresight are shown in adapting buildings and machinery to the processes through which stuff becomes finished product. Are similar skill and foresight applied to the development of the things through which houses may become homes, a construction camp a community, and livelihood, life? Apparently the answer is often in the negative.

See also p. 109. What City-planning Means.
p. 111. The City-planning Movement.

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19. THE CAUSES OF CONGESTION OF MANUFACTURES IN NEW YORK CITY[1]

[The reader should regard this selection as a continuation of the discussion of the relative merits of city, country, or suburbs as locations for industrial plants.]

The following are probably the principal forces that have brought manufacturing industries into the city, or have retained them in it.

First, immobility, i.e., the inability of certain old establishments, started on the outskirts of the city, to remove after the city's growth has enclosed them. Any disadvantages that each may suffer from congestion are counterbalanced by the difficulties and loss that would be incurred in transferring plant and employees, both bound to the soil by many ties, to a new locality.

Second, the advantages of a transportation center. New York City, as a point of intersection of transportation routes and of transshipment from land to water and vice versa, is a most economical place for assembling divers materials for manufacture and for distributing products. In combination with other advantages this force has drawn the following industries, among others, to New York City:

[1] By P. T. Sherman, former Commissioner of Labor, state of New York. Adapted from *Department of Labor Bulletin*, Vol. X (Nos. 36–39), 1908.

Industry	Number of Persons Engaged*	
	In State	In New York City
Furs and fur goods	8,066	7,660
Lead pencils and crayons	1,872	1,861
Canvas and sporting goods	1,584	1,286
Coffee and spice roasting and grinding	1,939	1,705
Paints, varnish, etc	3,259	2,939
Articles of cork	460	429
Cigars	28,028	20,695
Cigarettes	2,953	2,938
Flax, hemp, and jute	7,963	6,253
Sugar and molasses refining	3,760	2,635
Mineral oil products	2,944	2,119
Dyes, colors, and inks	2,098	1,587
Asbestos, graphite, etc	1,880	1,313
Rubber and gutta percha goods	4,883	3,077
Cabinet work, n.e.s	3,225	2,348
Pianos, organs, etc	13,163	10,134
Boat and shipbuilding	5,466	3,933

*Notice the high percentage of the workers in these New York industries who are in the city.

Third, labor advantages. New York City contains an unusually large population of unskilled laborers, which is constantly being replenished and augmented by an unequalled immigration. This population is generally uneducated and poverty-stricken. Its standard of living is of the lowest. And competition for employment among its members is most intense. They are, therefore, peculiarly subject to exploitation, sell their labor at the cheapest rates, and submit to the most unfavorable conditions of employment. And there is always or almost always a surplus of unemployed left over for extraordinary or seasonal operations—a condition seldom found elsewhere. For special reasons peculiar to the predominating races the superabundance of labor is greatest in the industry group "clothing, millinery, etc." Consequently competition for employment therein is most severe, and there result—in spite of the higher cost of living in the city—rates or wages and conditions of employment that defy competition elsewhere.

There is no such superabundance of skilled labor. In fact, owing to the entire neglect of industrial training in the American system of education, there is probably no part of the United States where there is a surplus or even a sufficiency of skilled labor. The greater part of highly skilled labor comes from abroad; and because it cannot in general be imported by contract, it must be picked up from ordinary

immigration. As New York City is the gateway for the bulk of immigration and the first resting place of a large part of it, local industries possess some advantage in securing this skilled labor and in the greatest variety. Moreover, merely from its size and from its centripetal attraction for the unemployed, the city usually holds the greatest number and variety of unemployed skilled laborers. The influence of these advantages is difficult to trace; but it has been material in bringing about the establishment of and in maintaining at least some industries in the city, among which the following may be cited as examples: pianos and organs, etc.; professional and scientific instruments; clocks and time recorders; jewelry and gold pens; lapidary work; plaster casts and ornaments; lithographing and engraving; dyes, colors and inks; beveled glass and mirrors; tobacco pipes.

Fourth, the advantages of convenience of delivery where production is chiefly or largely for local consumption, as against the disadvantages of out-of-town production, i.e., expense and danger of transportation and delay and uncertainty in delivery. This force is intensified in New York City by peculiar railroad terminal deficiencies and intra-urban traffic congestion. In estimating this influence, not only the consumption of the resident enumerated population is to be calculated, but also that of the large and extravagant visiting population. This influence is controlling, by itself in some instances, and in others in combination with some of the other forces elsewhere enumerated, in attracting the following industries: steam heat and power; electric light and power; malt liquors; artificial ice; confectionery and ice cream; bread and bakery products; crackers and biscuits; macaroni and food pastes; groceries, n.e.s.; mineral and soda water; bottles and jars; pressed, blown, and cut glass; beveled glass and mirrors; mirror and picture frames; paper boxes and tubes.

Fifth, the advantage to manufacturing industries closely connected with other industries of propinquity to the latter. This force includes the preceding, i.e., convenience of delivery and also something more, i.e., convenience of accessibility during any stage of manufacture, etc. This is well illustrated by newspapers. Their manufacture, i.e., preparing and printing the paper, must be carried on in close proximity to the professional work of gathering news, etc., and editing, and at a point convenient for prompt distribution through commercial channels. Another illustration is the jewelry industries, in which many forces tend to unite their manufacturing and com-

mercial branches in one establishment and to locate that establishment at the commercial center.

The following are some different phases of this influence, with examples:

a) Convenience for local repair, renewal, alteration, or extension of articles, is illustrated by the following industries: railroad repairs; laundries; telegraph, telephone, and fire-alarm apparatus; boat and shipbuilding; cleaning and dyeing.

b) The attraction of dependent or subsidiary manufacturing industries to the same locality as those other industries which they serve, or upon the waste or by-product of which they are dependent, may be sufficiently shown by the few following examples: clip sorting; sorting waste paper; glue, mucilage, etc.; cigar and fancy wood boxes; cooperage; dyeing, finishing, etc., of textiles; smelting and refining.

c) The advantage, convenience, or necessity of having the factory close to the commercial shop or market can be best shown under a commercial classification:

In *custom work*, by tailoring and dressmaking. In *job work*, by printing and publishing. In *retailing*, by the finishing, alteration, and repair departments of stores. Originally the practice of maintaining such departments was material in only a few trades; but the "department stores" have extended it over a wide field and to include incidentally much complete manufacture. In *wholesale selling*, by the widely prevailing practice in many of the clothing trades of assimilating their production to custom or "job work" by manufacturing in lots under the "hurry orders" and directions of visiting buyers.

All the industries included in the industry group, "clothing millinery, etc.," are examples of the effect of this influence; and also the specific industries enumerated in the following list: printing and publishing; paper goods, n.e.s.; bookbinding and blank books; lithographing and engraving; mirror and picture frames; traveling bags and trunks; mattresses, pillows, etc.; cabinet work, n.e.s.; upholstery goods; furniture and upholstery.

Turning now to the causes of relatively excessive concentration in the congested districts of the city, we are forced to take New York County to represent the congested urban center, and the other counties to represent its suburbs. It would be more in accordance with actual conditions to take Manhattan borough alone for the congested

district, and to class all the other boroughs as suburbs; but the figures, being collated in the bureau report by counties only, are not available for any better plan of comparison than that adopted. We have seen that the principal forces operating against the city are operating particularly against its congested center, i.e., New York County, but that nevertheless manufacturing is particularly concentrated within that county. Therefore the forces above enumerated which operate in favor of the city must also operate particularly in favor of that county. They may be considered in order in this connection.

First, immobility is purely negative, acting only to prevent the full operation of the opposite forces. But such as it is, it operates in proportion to the number of establishments, and as there are more establishments in New York County than in all the other counties together, it affects New York County particularly.

Second, the advantages of New York City as a transportation center are peculiarly in favor of New York County. It has almost a monopoly of the city's railroad terminals, and it is the terminal of a large majority of the regular water transportation lines. Truckage from their terminals to the other counties is slow and costly, owing to bridge and ferry congestion. It is only for goods imported by special charter or such as can be advantageously lightered from western railroad terminals and from terminal docks that the other counties are on an equal footing.

Third, the advantages of cheap labor are all with New York County. The colonies of recent immigrants are nearly all in that county. The immigrant clings to a home in the colony of his friends for many years, and he cannot be employed most economically at a distance from his home on account of the delay, uncertainty, and expense of transportation. There is, therefore, often an abundance of cheap labor available in New York County when it is scarce in the suburban counties. This attracts many factories to New York County, and their existence there with their opportunities for employment aids in holding the immigrants within that county. In this way an endless chain of congestion is created.

Fourth, the advantages in delivery for local consumption cause manufacturing to concentrate in New York County out of proportion to its population, because its consumption is out of proportion to its enumerated population, for the reason that transients and visitors are concentrated in that county, and that a large proportion of the

population of the other counties carry on their business and therefore live and consume during the day in New York County. The congestion at the bridges and ferries across the water barriers that separate New York County from the other counties is sufficient to make it uneconomical to manufacture in the latter for consumption in the former, to any material extent.

Fifth, the advantages of propinquity to other industries and businesses are all in favor of New York County, because in it is concentrated the major part of the city's commerce. It therefore appears a priori that the main forces that operate to draw manufacturing to New York City also act particularly toward its most congested county.

Turning to the concrete side of this subject, the most material factor in congestion is the group "clothing, millinery, etc." There are 204,519 persons engaged in the industries included in this group in New York City, 178,094, or over 87 per cent of whom carry on their work in New York County. This group is, therefore, both the most numerous and the most concentrated. The following are the figures for its most congested industries:

Industry	Number of Persons Engaged	
	In New York City	In New York County
Tailoring	59,251	47,907
Dressmaking	78,868	75,046
Suspenders and other furnishings	990	990
Men's neckwear	2,998	2,897
Women's white goods	11,302	9,213
Infants' wear	2,549	2,293
Ladies' neckwear	4,559	4,551
Corsets and garters, etc	2,069	1,756
Artificial feathers and flowers	4,262	4,225
Millinery	8,569	7,792
Curtains, embroideries, etc	1,614	1,380
Umbrellas and parasols	1,107	1,106
Cleaning and dyeing	1,604	1,151
Clip sorting	1,696	1,467

So much for the extent and causes of the concentration and congestion of manufacturing in New York City. New York City is primarily commercial. Its commercial center is the lower end of New York County—the lower half of Manhattan Island. This district is congested with commerce and residences; and in addition

there are in the county as a whole—and in large proportion in this congested part—76 per cent of the manufacturing population of the city, or 41 per cent of such population of the state.

C. Changing Location and Location Planning

A review of the material thus far covered in this chapter will make it clear that there are many factors making for change in the location of existing business units. Under what circumstances should their managers yield to these factors? How can they determine what new site shall be chosen? Can they secure assistance in studying such problems? The last two questions apply also to the case of a new business venture which may be in contemplation.

It is not necessary to present here material upon the factors making for change. Problems 1 to 9 below will serve to recall certain aspects of this matter either already presented in these readings or lying in our general knowledge. It is worth while, however, to present certain material bearing upon the weighing of evidence which may be available concerning alternative locations (Selections 20 and 15); upon the various enterprises which provide material looking toward the solution of location problems (Selections 21 to 24); and upon the awakening interest of society at large in certain location matters (Selections 25 and 26). No exhaustive treatment of any of these topics will be attempted. Instead, both the selections and the questions below should be regarded as samples of the problems at issue.

A surprisingly large number of agencies assemble and distribute data of value to the manager who is studying plant location. To begin with there are various governmental reports, both state and federal, of which the census volumes will serve as an illustration. Such material, speaking generally, tells what has happened rather than what will happen and is accordingly of value primarily as background material. The drift of the past may or may not be indicative of the tendency of the future. Again, industrial agents of railways quite commonly collect evidence—often *ex parte* evidence it is true—concerning opportunities along their lines. Sometimes they make quite comprehensive surveys and try to promote a balanced development of industries; sometimes their data are little more than summaries of local opinion in the communities concerned. Some real estate firms, too, make more or less of a specialty of studying sites, particularly of factories, and are in a position to give the interested manager

local material of very great value. Closely related to the work of such real estate firms is the development company of the sort mentioned in selection 21, which may be said to charge a price for services rendered in connection with plant location and construction. Naturally, their literature is easily secured. Material in which more of the comparative element enters may be secured from some firms of industrial engineers who have built up files of information upon location problems and who undertake to investigate appropriate locations for their clients. One must not overlook, too, the local chambers of commerce, or other similar organizations, who sing the praises, sometimes with helpful analysis added thereto, of the community opportunities and may even stand back of some development project (see Selection 23). A very respectable beginning has been made in the development of professional skill in dealing with location problems.

PROBLEMS

1. Name some industries whose location will probably shift in the near future. Give your reasons for believing that such will be the case.
2. "Local skill, traditional practice, personality, import tariffs, which have built up and localized industries must succumb." Why or why not?
3. Is it likely that municipal legislation, or regulation, will tend more and more to exercise control over location of industries? Will any other regulating agencies?
4. As time goes on do you expect to see industries *more* or *less* dependent upon location in proximity to skilled labor supply?
5. Can you cite cases where (*a*) the growth of technical knowledge, (*b*) movements of population, (*c*) transportation and communication improvements, (*d*) social control, have led to changes in location?
6. Tabulate the reasons why one may expect changes in industrial location in the future.
7. "There is a certain amount of inertia that attaches itself to industry when it has once been successful in a given place." What are the component parts of the inertia?
8. "As society has become increasingly one of impersonal relations, and firm reputation becomes a less significant asset, scientific analysis of plant location problems becomes more important." Why or why not?
9. "As any country develops industrially, as transportation becomes more effective and good labor supply more widespread, the intelligent location of manufacturing enterprises must be governed increasingly by strict economic consideration and less by inherited influences." Do you agree? What difference does it make to you?

10. "In these days of indirect costs, small differences are great differences. This means that any single question, such as location, affecting overhead profoundly is worthy of most careful study." Will this have a bearing upon re-location?
11. "The location and construction of a large modern industrial plant may require the services of several specialized advisers." Why? Who are they?
12. What sort of educational training and experience would you consider necessary for a person who is to act as industrial agent or adviser on questions of factory location?
13. Is there a place in the industrial world today for the professional plant location experts? What will be the probable future of the profession?
14. What should you say of the value of an "industrial survey" made by a board of trade, a commercial club, a municipal commission, an industrial engineer, a real estate agent, a railway company? What is an industrial survey?
15. Tabulate as many sources of information as you can which could be used if you were studying where to locate a plant.
16. Notice the table on page 95. Comment upon the value of any such table for the purpose at issue. Comment upon the value of this particular table.
17. What is a method by which you would go about determining whether, in a centralized bargaining center, there was room enough for another business of the same nature as those already being successfully carried on?
18. Can accounting be used to test the merits of a given location? If so, can it be used prior to the actual location?
19. What general principles explain the success of such private enterprises as the Central Manufacturing District?
20. What would be the advantages and disadvantages of locating in such an area? Can you tell whether it would be a better proposition for some businesses than for others?
21. What do you regard as the underlying principles in case of such enterprises as the Bush Terminal or the Toledo Factories Buildings? Some writers call such enterprises industrial incubators. Why? What classes of enterprises should you expect to do well in such buildings?
22. Free sites and local inducements are often injurious to both the city and the factory. Do you agree or disagree, and why?
23. What interest, if any, has the business manager in town planning? Is his interest, if any, philanthropic, artistic, or pecuniary? Answer the same question with respect to garden cities.
24. "For the general comfort of the cities, factories should be confined to their special areas." Why? Has the manufacturer any gains flowing from this districting?

25. "These are days of measuring devices in business." What measuring devices can you enumerate as being useful in plant location or re-location?
26. Draw up an outline of the main points in this section.

20. HOW TO STRIKE A BALANCE IN LOCATION FACTORS[1]

[This selection is an interesting illustration of the methods commonly used by engineers. It is helpful to think of such devices as "measuring aids of administration." Does the classification of factors here given contradict the classification given on page 15?]

In many parts of the United States, particularly the portion east of the Mississippi River, manufacturers are confronted with the problem of reorganizing and rehabilitating their present plants in order to meet changed or changing conditions. Some of these problems are brought about by tariff influences, others by western competition, and still others are due to changes in the sources of raw materials.

The question as to how this rehabilitation is to take place presents itself squarely to the management. This question usually is: Shall we develop our present property and plant by such additional acquisitions of property as will take care of the needs of the business—or shall we consider selling or leasing our present plant and constructing a new one in a more advantageous locality, with perhaps better natural characteristics?

Let us see then if we can strike a balance of the various factors entering the problem that will help us intelligently to decide the question.

By drawing up a list of questions that are the result of analyzing the situation and ascertaining the facts, we find that practically fourteen items cover the important factors relating to the present plant location and that seven items suffice for the consideration of a new location.

PRESENT LOCATION

1. P.L.—What is the investment in the present plant?
2. P.L.—How much of it is fixed capital?
3. P.L.—What proportion of (2) P.L. could be recovered by the sale of the property?

[1] Adapted by permission from H. V. Coes "The Rehabilitation of Existing Plants as a Factor in Production Costs," in *The Engineering Magazine*, XLIX (1915), 357–72, 560–73.

4. P.L.—How much additional property would have to be acquired to properly develop the plant?
5. P.L.—What would the investment be?
6. P.L.—Is the labor market satisfactory?
7. P.L.—Is the raw-material market satisfactory?
8. P.L.—Are the shipping facilities adequate?
9. P.L.—Can (8) P.L. be made so?
10. P.L.—Can the present buildings be suitably altered to adequately serve the business?
11. P.L.—What will (10) P.L. cost?
12. P.L.—Can the present buildings properly be made a part of a logical comprehensive development of the plant?
13. P.L.—What are the fixed charges of the present plant?
14. P.L.—What is the production cost per unit?

NEW LOCATION

1. N.L.—What will the land for a new site cost?
2. N.L.—What will the buildings cost when completed and ready for occupancy?
3. N.L.—What will be the fixed charges on (1) N.L. and (2) N.L.?
4. N.L.—How much will (1) N.L. and (2) N.L. be reduced by (3) P.L.?
5. N.L.—Will (6), (7), and (8) P.L. and other considerations be sufficiently improved as to affect production cost, (14) P.L.?
6. N.L.—Will the production cost per unit be lowered?
7. N.L.—Will the margin between the selling price and production cost pay (3) N.L. plus a sinking fund and leave a sufficient profit to warrant the undertaking?

If we tabulate the facts brought out in any given case (such, for instance, as the assumed one), the mind can more readily compare them and can intelligently weigh the information with a view to securing the proper balance.

If we list the "factors governing the location of an industrial plant," we find that these are divided into twelve groups. The "weight" given in parenthesis at the right is an arbitrary scale of values given to each group and subdivision thereof, according to its relative importance to the total factor valuation. In our assumed case, for example, let us designate "present location factors" as minus (−), and "competitors' or new location" as plus (+). Accepting then the scale of weights, let us balance up the relative advantages of our location with the ideal, and similarly our competitor's location (which we think is better than our own) also with our ideal and set these values down. Suppose we find that our present location meas-

ures up to only $55\frac{1}{2}$ per cent of our ideal—our competitor's, on the other hand, $75\frac{1}{2}$ per cent of the ideal. Clearly, much light has been thrown upon our problem.

1. Proximity of raw-material market (weight $1\frac{1}{4}$)
   a) Rail service
   b) Water service
   c) Supply
2. Proximity to consumers' market (weight $1\frac{1}{2}$)
   a) Large cities
   b) Rail service
   c) Water service
   d) Advertising value or influence of plant
   e) Competitors
3. Labor Market (weight $2\frac{1}{4}$)
   a) Character of labor and supply
   b) Percentage of unemployed females (women and girls)
   c) Percentage of unemployed boys (above legal factory age)
   d) Price of labor—cost of living
   e) Specialization of labor
   f) Influence of climate
   g) Associations or unions
4. Power (weight 1)
   a) Price and character of fuel (coal, gas, oil)
   b) Hydro-electric or water power
   c) Central station
5. Influence of climate (weight $\frac{1}{4}$)
   a) On labor
   b) On product
6. Utilization of waste products (weight $\frac{1}{4}$)
   a) Disposal of waste products
   b) Market value of waste products
   c) Cost of disposing of same, if unmarketable
7. Perishability (weight $\frac{1}{4}$)
   a) Raw materials
   b) Finished product
8. Freight rates (weight $\frac{1}{4}$)
   a) On raw materials
   b) On finished products
9. Legislation, regulation, or ordinances (weight $\frac{1}{4}$)
   a) State legislation (corporation laws, taxes, employers' liability)
   b) Municipal, town, or county regulations or ordinances (taxes, factory building inspection)

10. Banking facilities (weight 1)
    a) Size of—handling pay rolls, etc.
    b) Credit
    c) General utility
11. Site of real estate (city, suburb, country) (weight $\frac{3}{4}$)
    a) Price of
    b) Character of soil
    c) Cost of preparing site
    d) Foundations
    e) Floods
12. Building materials (weight $\frac{1}{4}$)
    a) Local sand, gravel, etc.
    b) Crushed stone
    c) Brick
    d) Timber
    e) Steel
    f) Cement

It should be borne in mind, however, that the scale of weights must be varied to suit the industry. It might very well happen for a particular industry that (7) would be a very important factor and the other factors scaled accordingly. But this method has the advantage of enabling us to judge the relative importance of the factors impartially and gives the mind definite numerical values to weigh instead of abstruse facts.

21. AN EXAMPLE OF PRIVATE ENTERPRISE IN DEVELOPING PLANT LOCATIONS[1]

[There are many cases in which private enterprise has done much of the preliminary work in plant location and construction and sold its services to businesses seeking locations. The Central Manufacturing District of Chicago may be taken as typical of such cases. Does the classification of relationships given on page 15 fit in with this selection?]

The reason we recommend the Central Manufacturing District as an ideal location with respect to service is that it offers the highest type of transportation assistance. The Chicago Junction Railway serves the District throughout and moves any kind of freight in any quantities. It is what is known as an inner belt line. Thirty-nine

[1] Taken from a letter sent out by one of these concerns, the Central Manufacturing District of Chicago.

railways, twenty-two of which are great systems, terminate in Chicago, the world's greatest railroad center. It is easy to see what such tremendous facilities mean to manufacturers situated in this city. The Chicago Junction Railway represents the value of all of these facilities combined, in that it connects with each and every one of them and gives to the manufacturer located on its rails the same service which could be obtained by direct connection with or location upon any one of them.

In speaking of Chicago Junction Railway Service any system may be used applicable to either carload or L.C.L. shipments. Carloads made up at the plant of any concern in the District can be sealed at its doors and projected with the utmost possible dispatch via any route specified at the through Chicago rate without the various transfers, inspections, and possible reloading of contents. L.C.L. freight usually is more or less of a bugbear to the manufacturer. Ordinarily it is accepted only at certain stations, and often in the congestion at these stations shipments which he particularly desires to have forwarded immediately become misplaced or lost, and he loses the business of a good customer through the ensuing delay. In order to reach these stations it is necessary for the producers to maintain expensive automobile or horse-drawn vehicle transportation. The Chicago Junction L.C.L. freight-handling system circumvents delays, avoids the maintenance of truck fleets, and eliminates endless worries. It is roughly as follows:

To the several union freight stations maintained in or near the Central Manufacturing District, L.C.L. shipments may be forwarded by trap cars upon their arrival at the stations. These trap cars are unloaded and contents classified according to destination. Any industry may put in the same car shipments destined to any number of points. The station classification lumps the shipments to any one distributing point and these are loaded together in a car which is dispatched directly to the gateway point. This car is not disturbed in any way from the moment it leaves the union freight station until it arrives at the gateway point, where its contents are broken up for distribution. Outgoing freight is pulled from the union freight station twice daily. Locomotives from the various railroads come to these stations and extract the quotas for their several lines. Freight sent in is dispatched the same day. With the Chicago Junction each day's business is separate unto itself. Each morning sees a clean slate to begin upon. Its service is absolutely dependable.

Incoming freight destined to the various industries in the Central Manufacturing District is handled with the same dispatch, but in reverse order. It comes to the Chicago Junction Railway from the various railroads and is delivered at once, carloads remaining intact to the doors of the industries, package cars being broken up and their various contents classified according to assignees.

Several years ago there was instituted what is known as the Traffic Bureau of the Associated Industries of the Central Manufacturing District. This bureau draws its members from the various industries in the District and employs a traffic director, who is familiar with all phases of the traffic problem. It is his duty to secure co-operation from the various trunk lines, also to see that the Chicago Junction Railway maintains its standards of service at all times. The traffic director answers all complaints, investigates delays, traces shipments, suggests betterments, and generally attends to the shippers' interests.

There are industries which have a great interest in water transportation. On account of its cheapness it is highly desirable whenever practicable. One branch of the Chicago River flows through the Central Manufacturing District and is used by a few of the industries which are fortunate enough to have dock property. It is not used to the extent it might be for the very excellent reason that at Twenty-Sixth and River streets the Chicago River and Indiana Railroad, an ally of the Chicago Junction Railway, maintains a large dockhouse on the main river and the drainage canal, which has a capacity sufficient to permit loading ten large lake boats at one time. This feature represents considerable value to interests whose important points of delivery are other cities situated on the Lakes. It also facilitates the ingress of many raw materials.

Chicago is the world's great central market. It is the distributing center of the United States, the financial center of the West, and lies within easy distance from the sources of innumerable raw materials. Among these might be mentioned iron, copper, lead, zinc, petroleum, lumber, grain, and many others. Bituminous coal in large quantities is produced within a radius of two hundred miles. Just as Chicago is the center for the Middle West, so the Central Manufacturing District is the center of Chicago. The advantages claimed for Chicago are more nearly identical with those claimed for the Central Manufacturing District than they could be with any other industrial district in the city.

The problem of securing labor to carry on the business of an industry is of paramount importance. There is no judgment shown in locating a manufacturing plant, no matter how splendid the site, nor how excellent the railway facilities, where the manufacturer is unable to draw the necessary help. Many plants have been known to fail simply because in seeking locations, they have neglected this most important prerequisite. Again the Central Manufacturing District proves its superiority over other locations. Within four miles from the corner of Thirty-ninth Street and Ashland Avenue dwell 1,000,000 people. Of this number about 500,000 are male adults and 400,000 female adults. There are a number of nationalities represented in this population, but the American percentage covers more than half of the number.

After the location has been found suitable in point of proximity and adequate labor supplied, the problems of transportation for this labor and its stabilization when once enlisted come into consideration. People must have means of getting back and forth between their homes and their employment. If their employment is easily reached without heavy expenditure of time, working people are much more liable to be satisfied. The Central Manufacturing District is bounded and traversed by several street car lines. North and south lines on Halsted, Morgan, Ashland, and Western lead directly to it, while Thirty-fifth and Thirty-ninth Street lines permit crosstown transfer to within three or four minutes' walk from any location.

The Central Manufacturing District has developed standard designs which are repeated in its buildings as they are put up. The best possible lighting arrangements, sanitary equipments, and safety appliances, including complete sprinkler installations, are features of this construction. The exteriors in conformity with the standard design adopted are made attractive by towers which in many cases also serve to carry the tanks for sprinkler systems, and the use of terra cotta, which does not add materially to building costs, but at the same time distinctly adds tone to the general appearance. The perception of the dullest worker is awakened to the fresh parkways in front of the buildings and he naturally regards his place of employment with pride in its attractiveness. The attitude in which the laborer enters the place in which his days are spent greatly affects his efficiency and the quality of the service he will perform for his employer.

The value of advertising has come to be felt with greater depth and sincerity just within the past few years. There is a great deal to be gained by an alliance with an organization whose progress and ideals are unquestioned. It is a very creditable advertisement for a manufacturer to say that he is located in the Central Manufacturing District. The District has become known as the advocate of industrial right living. For a manufacturer merely to say or to advertise the fact of his location in this District is to promise to his labor ideal working conditions, to the people from whom he buys the assurance of his growth and added requirements of the materials which they have to sell, and to his customers the best product at reasonable prices and reliable service.

The District has many advantages which cannot be approximated elsewhere in an industrial and manufacturing center. It is provided with well-paved streets, cement sidewalks, adequate sewer and water lines, grass parkways, and efficient lighting and power systems. Within its boundaries are located the Central Manufacturing District Bank and Club and the Western Union and Postal Telegraph offices. The Wells Fargo Express Company has an office in the District and all other express companies give the District preferred service. The mail service throughout the District is excellent.

Tenants are located in the Central Manufacturing District under one of the following forms of contract:

a) Sale of ground for cash, purchaser agreeing to make substantial improvements within a reasonable time.

b) Contract of purchase. Under this form of contract the trustees would agree to erect the building and sell both land and building upon the basis of a payment of 25 per cent of the estimated valuation of land and building in cash upon the signing of the contract, the balance to be spread over a term of ten years, with interest on the deferred payments at 6 per cent per annum.

c) Long-term lease. Under this contract the annual rental would be 5 per cent upon the value of the land as based, plus 8 per cent on the cost of any building and improvements erected by trustees, the tenant to pay in addition taxes and insurance. The term of our lease is twenty-five years.

22. ANOTHER EXAMPLE—THE BUSH TERMINAL[1]

Bush Terminal is actually an industrial city. It contains factories, storehouses, restaurants, a trolley line, a hospital, a gymnasium, three clubs, a moving picture show, schools, a post-office, a telegraph office, wireless station, express offices, wharves, piers, railways, stables, power sub-stations, and all the miscellany of a busy city of almost three hundred separate industries.

Within the bounds of Bush Terminal there is carried on as much manufacturing and general business as would normally be found in a thriving city of 250,000 inhabitants. The actual working population of the Terminal is over 24,000. In approaching the Thirty-ninth Street section of Brooklyn, one is struck with its resemblance to the shore line of Manhattan, but on a much larger and more spacious scale. Extending out into the water are enormous piers which characterize the water-front of New York City itself. As many as twenty-seven steamships at one time have been docked at these piers, with room for many more, and so modern are the facilities for loading and unloading vessels, so spacious the waterways between the piers, so complete the system of railroad tracks which lead from them, that their steamer capacity can be multiplied by three when compared with any other similar piers along the Atlantic seaboard. Behind these piers there stretches a complicated system of railroad tracks which resembles a huge freight yard or the terminal of a great railroad, which, in fact, it is, and, more than this, the terminal of many great railroads. Behind this freight yard again are a series of model warehouses of huge capacity, splendid gray-white structures of most unusual size, so designed that every inch of space may be used to the greatest advantage, and designed further to give the very maximum of ease and rapidity in filling them with, and emptying them of, merchandise of whatever kind. Behind these warehouses more railroad tracks commingle in a big humming system, and then is seen a long vista of still more warehouses in orderly rows, so compact that one scarcely realizes the enormous territory they cover.

Stretching away to the north is row upon row of gigantic model loft buildings—mammoth granite-looking structures—larger than New York skyscrapers, something of the same appearance even in height, through their enormous window space and by reason of their outward appearance of being built of gray stone. These, too, are

[1] Taken from various advertising literature of the concern.

of steel and concrete and, although they are silent outside, they are humming within with the ceaseless activity of thousands of workers.

The success of this industrial community is summed up in two words: service and co-operation. In theory the administration of Bush Terminal is extremely simple; in operation it is highly complex and calls for expert knowledge in many branches. The principle upon which the Bush Industrial City is founded may be stated briefly: to supply the manufacturer with every service that can be secured economically upon a co-operative basis.

Of what does such service consist? First, of course, transportation facilities. No manufacturer can progress very far toward large success without adequate and economical means of receiving his raw materials and shipping his finished product; in fact, many a promising business which today is struggling along as a semi-failure might be a big success with proper shipping facilities. Next in importance are power and steam for manufacturing. These can be supplied upon a co-operative basis at less final cost than if individually generated. Fire protection is a service which can be secured most economically by a community, and such protection, if provided upon a thorough engineering basis, means substantial saving in insurance. The scientific management of the labor market and the operation of a mutual employment bureau is a service of tremendous importance. Finally, having available space for storage of seasonal stocks and having additional manufacturing space always ready to accommodate a growing business are factors which no far-sighted executive overlooks.

There are, of course, many minor forms of service which can be supplied by a community at a fraction of what they cost the individual. Night watchmen, porters, emergency hospital with doctors and nurses, local delivery service, express and mail facilities—these merely suggest things which a well-managed, concentrated industrial community may enjoy virtually without cost. When, as at Bush Terminal, almost 300 tenants "club" together in the purchase of such items, the individual tax upon the "overhead" is hardly appreciable.

According to the system in vogue, incoming freight shipments which arrive at the New Jersey railway yards on one day are placed upon the siding of the Bush tenant's building early the following day. The cartage expense, both in time and money, is reduced to the transferring of the freight from car to loading platform and thence to the

tenant's floor. A man with a hand truck travels probably fifty feet to accomplish such "cartage." This man, by the way, is an employee of the Bush Terminal. The manufacturer-tenant employs no truckmen, owns no horses or motor cars, requires no porters or roustabouts. Freight consigned to him f.o.b. New York means to the Bush tenant that the freight is laid down inside his own factory.

Outgoing shipments are handled with equal facility. The manufacturer occupying space in the Bush Industrial City simply notifies us that he has so much freight to be shipped. If it amounts to a carload, the car is placed on the siding at his door; we receipt for the freight at his own floor, put it aboard car and deliver the car to the proper railway at its Jersey terminal yard. Less than carload shipments of several tenants are frequently grouped and placed by us in through cars so that they reach destination without transfer. In any event, the tenant has absolutely no worry or expense in freight handling. It is all done upon a community basis. The freight, in and out, of 276 tenants is collected, assorted, billed, and forwarded by a co-operative organization which means the minimizing of delays and the elimination of trouble, waste, and expense.

Electric current for light and power is furnished to Bush tenants at 3.3 cents per kilowatt-hour. This is approximately one-half the rate paid by the average manufacturer in New York City, and is probably less than the generating cost of current in the isolated plant of the average small-town manufacturer. Here again we have an example of co-operation. The Bush Terminal buys current for all its tenants and gives to all the benefit of a wholesale rate. The advantage is strikingly shown in the matter of lighting, for the tenant who uses comparatively little power in his manufacturing process is still enabled to light his premises at the 3.3 cent rate, where the same manufacturer located in New York would probably pay 7.5 cents per kilowatt-hour for electricity for lighting.

A similar arrangement in regard to steam for manufacturing purposes is in vogue. Steam is sold for 1 cent per horsepower-hour and is furnished in any quantity and at any time. Since the steam is all metered, the tenant pays for what he actually uses in his manufacturing processes.

And insurance is important. At Bush Terminal the rate is only 7 cents per hundred in the mutual companies; 15 cents per hundred in the line companies. This rate is due to the elimination of every possible fire hazard and the installation of every possible safeguard.

The Terminal maintains an emergency hospital to care for accident cases. It maintains a Bureau of Social Service which develops the efficiency and loyalty of all the working people employed by its tenants. It conducts an employment department which minimizes the labor problem and insures an abundance of both skilled and unskilled labor. It operates lunch rooms, rest rooms, clubs, and other employees' benefits which in the aggregate make the Terminal a most desirable place of employment and attract the highest class of workers. A post-office, express offices and telegraph offices are on the ground. An elaborate and efficient city delivery system is operated. Traffic experts minimize the cost and speed the handling of all incoming and outgoing goods.

In short, the Terminal management accepts as its duty the operation of every service which can be economically performed upon a co-operative basis and thus the tenant-manufacturer is free to concentrate his time, energy, talents, and capital upon the money-making factors in his own business. Where a manufacturer located alone must give thought and vitality to hundreds of matters which are in themselves profitless side issues, the manufacturer located in the Ideal Industrial City has no such distractons—he simply pays rent, and modest rent.

The Bush Terminal International Exhibit Building is the latest extension of Bush Terminal service. It was designed primarily to give our 276 tenants and more than 2,000 customers a sales headquarters in the very heart of New York's buying district. With this knowledge, we have erected a building unique in commercial history. It contains every resource and convenience desired by the buyer who visits the greatest marketplace in the world. But it contains more: It contains every facility for the out-of-town manufacturer who wishes to place his wares before these buyers in a favorable manner and at low expense.

There are exhibition rooms for the display of merchandise. There are single offices, suites, deskroom, the services of specially trained salesmen, stenographic and clerical help, conference rooms, an auditorium (in which, for example, moving pictures of your factory and manufacturing processes may be shown to prospective customers). There is a bureau of information, a library of American and foreign commercial data, and a corps of experts to assist in organizing and developing export business. Nothing which will facilitate the selling of goods and building of a permanent market has been overlooked.

The Bush Terminal International Exhibit Building (in connection with Bush Terminal service) solves your problem of an eastern and export sales branch. Whether you are ready to put one man here or a hundred, we can provide the location, the opportunity, and the service to insure that such a branch will be undertaken on the basis of absolute efficiency.

23. STILL ANOTHER EXAMPLE—THE TOLEDO FACTORIES BUILDING[1]

Small light manufacturing plants located in rented quarters are often seriously handicapped by being compelled for lack of better accommodations to occupy old, out-of-date buildings with few of the advantages of modern factory buildings. With poorly arranged factory space in fire-trap structures and improper lighting, heating, and ventilating, their overhead charges are high and consequently the cost of production is excessive. Some plants require such a small space that the erection of a factory building is not practical, and owners of other industries do not care to tie up their capital in factory buildings.

Toledo, Ohio, is a city that has solved the problem of providing adequate factory facilities for small industrial companies and has solved this problem in an interesting manner. The carrying out of the plan adopted has resulted in the erection of a factory building that, in addition to being thoroughly modern, is unique in a number of particulars, one of the most important of which is the flexibility of the interior arrangement so that a tenant can secure the amount of space he needs and can acquire additional units of space as the growth of his business warrants.

The movement to erect the factory building originated with the Toledo Commerce Club, which, after investigating conditions, found that it was difficult to secure suitable space for light manufacturing in that city. This lack of accommodations interfered with the establishment of new industries there. It checked efforts to induce companies with plants elsewhere and looking for a new site or a new company looking for a favorable location to locate in that city. The Commerce Club as an organization was unable to undertake the erection of a factory building, but a company known as the Toledo Factories Company was organized within the membership of the club,

[1] Adapted by permission from "Modern Factory Building for Small Plants," *Iron Age*, XCV (1915), 188–91.

practically all the members being stockholders. To finance the project a $100,000 5 per cent bond issue was authorized. The bonds were taken by some of the leading local banks, and $194,000 in common stock was sold. While the primary object was to help the city, the details of the project were carried out with the idea of making it a safe financial investment with a fair turn for the stockholders. Earnings have been sufficient to warrant the directors to authorize recently the payment of dividends at the rate of 4 per cent per annum of the stock.

[The account of the advantages claimed for the Toledo Factories Building is quite similar to the advantages claimed in Selections 21 and 22, and is therefore omitted.]

24. EXAMPLES OF CITY ADVERTISING

A[1]

Why is Philadelphia the best city in the United States for the establishment of manufacturing enterprises? Why have more than 8,000 industrial plants already located in Philadelphia, with new enterprises constantly augmenting their number? There are many reasons, among which may be cited the following:

Philadelphia has 267 wharves and docks to accommodate ships.

Philadelphia has thirty-seven miles of improved water front.

Philadelphia stevedores can load one hundred 10,000-ton ships simultaneously.

Philadelphia's port charges are cheaper than any other port in the country.

Philadelphia has three great trunk lines connecting its water front with the entire country.

Philadelphia's dockage eliminates the necessity for lighters.

Philadelphia's unloading plant can handle 6,000 tons in ten hours.

Philadelphia has a grain elevator which can load 15,000 bushels an hour.

Philadelphia has the most efficient pilot service in the world.

Philadelphia manufacturers can ship imported goods inland for six cents a hundred pounds less than can the manufacturers of New York.

Philadelphia is the only absolutely fresh-water port on the Atlantic seaboard, and the water is beneficial to iron-hull ships.

[1] Taken from *Philadelphia Year-Book* (1917), p. 11.

Philadelphia is second only to New York in foreign tonnage.

Philadelphia has regular lines sailing through the Panama Canal.

Philadelphia has numerous lines connecting it with Europe.

Philadelphia imports more leather than any other city in the world.

Philadelphia makes more textiles for export than any other city in the world.

Philadelphia has a belt-line railroad along the water front specially built to facilitate the loading and unloading of ships.

Philadelphia has behind it one of the greatest coal regions in the world.

Philadelphia has behind it the greatest iror region in the world.

Philadelphia has behind it some of the greatest oil fields in the world.

Philadelphia exports nearly a billion gallons of oil annually.

Philadelphia manufactures more locomotives than any other city.

Philadelphia has cheaper and faster railway connections with the South and Southwest than Boston or New York.

Philadelphia also has substantially cheaper rates for shipments to the Mississippi Valley.

Philadelphia has the greatest tobacco humidors in the country.

Philadelphia exports 4,000,000 tons of coal annually.

Philadelphia refines 500,000 tons of raw sugar annually, or one-sixth of the entire output of the United States.

Philadelphia is only 1,946 miles from the Panama Canal.

Philadelphia piers have sunken railroads to facilitate loading from ships.

Philadelphia has the most efficient export and import storage houses in the country.

Philadelphia has the two biggest shipyards in the country.

Philadelphia's harbor was improved in 1915 by the expenditure of more than a million and a half dollars.

Philadelphia's banking institutions have prompt communication with Europe, Asia, and Africa.

Philadelphia and New York statistics prove that shippers can save from $600 to $1,000 on the average cargo by receiving and forwarding through Philadelphia rather than New York.

Skilled labor is plentiful; land reasonable in price; industries are encouraged by the city government, civic organizations, and by all the citizens of Philadelphia.

B[1]

Here are the reasons given by industrial leaders in the United States—among them Charles M. Schwab, Bethlehem Steel Company; J. E. Alfred, capitalist; M. M. Upson, secretary of the Raymond Concrete Pile Company; B. W. Dudley, president of the Prudential Oil Company (all of New York)—why they located plants in Baltimore:

1. "Its geographical position making it the best manufacturing and distributing point on the Atlantic Coast."

2. "The nearness of Baltimore to the coal fields; the low price of coal and its good quality." Coal is delivered at Sparrows Point, Baltimore, at 20 cents per gross ton less than at Bethlehem or other cities similarly situated, with a profitable differential over other seaport cities.

3. "The low freight rate to and from Baltimore by rail." Baltimore has a 3 cent per hundred pounds differential under New York and Boston to and from the West; a 2 cent per hundred pounds differential under Philadelphia.

4. "The low cost of power—$0.008 per thousand kilowatts for electricity; 35 cents per thousand feet for gas, the lowest on the Atlantic Seaboard."

5. "The deep-water channel which permits the largest ships to enter port day or night." The channel has a depth of 35 feet from ocean to piers.

6. "The low cost of living in Baltimore and the comforts and conveniences within reach of laboring classes." The labor is permanent, as Baltimore has a larger number of individual home owners in the laboring classes than any other American city.

7. "The disposition of the authorities to be reasonable about tax assessments and the co-operation of banks and the city officials." Machinery and tools are exempt from all taxation.

The Bethlehem Steel Company, by locating in Baltimore, will make a saving on freight rates alone of $800,000 each year. This is equal to 5 per cent profit on an investment of $16,000,000.

Let us figure with you how, by locating your factory in Baltimore, you can capitalize its many advantages. If you are interested, a special representative will call on you at your factory and analyze your specific business and tell you what Baltimore has to offer.

[1] Taken from an advertisement in a business periodical.

Write today for book of Baltimore's advantages.
Move your plant to Baltimore!

JAMES H. PRESTON
Mayor

ADDRESS, DEPARTMENT 1
CITY HALL, BALTIMORE

25. WHAT CITY PLANNING MEANS[1]

I. *Definition:*

City planning is good sense and forethought applied to the building of cities.

II. *Purpose:*

City planning aims to make a city

Convenient Economical Healthful Pleasant	for	Work Business Home Life Social Life

III. *Scope:*

City planning is the science of designing cities

a) It is not the organization of administrative departments
b) It is not efficiency in the civil service, or economy in the purchase of supplies
c) It is concerned with construction rather than with operation or maintenance
d) It tells how to do things which, if done wrongly, either could not be changed, or could be changed only at great expense
e) It prevents mistakes which make inevitable other mistakes which cannot be corrected
f) It determines the layout of a city, the location of things, and the types and character of permanent structures, so far as these are matters of public interest

IV. *Methods:*

a) Spread of ideas; public opinions; expert advice
b) Constructive public action
c) Voluntary co-operation
d) Control of private activity, when necessary and helpful, as for example when it
   1. Limits heights of buildings and the proportion of lot areas to be built on

[1] Adapted from a pamphlet issued by the Niagara Falls Chamber of Commerce.

2. Regulates construction of buildings
3. Establishes zones or districts to be developed in different ways
4. Supervises the housing of the people
5. Encourages the platting of the suburban areas in harmony with the general plan of the city
6. Controls the development of privately owned public utilities and the location of their works

With proper city planning no one owning property is permitted to develop it as he pleases, unless his pleasure respects the general welfare. In yielding a given degree of control to the community, the individual citizen is more than repaid by the benefits that come from the harmonious development of his town and by protection from the possible whims of his neighbors.

V. *Encouragement of Industry:*

City planning aims to promote conditions which are favorable to industrial development, and at the same time to prevent the abuses which result from mere material prosperity.

a) It provides:
1. An industrial district
2. Reclaimed lowlands convenient to waterways
3. Improved harbors and deeper channels
4. Railroad connections and switching facilities without discrimination

b) It reaches out for
Cheap water, light and power, and makes the town pleasant for laborers' homes

VI. *Suburban Development:*

Cities are growing rapidly. The outlying districts offer the chief opportunity for city planning, other than the costly tearing down and reconstruction of old areas. When the city as a whole is too shortsighted, impecunious, or helpless to apply city planning to the suburbs, the task sometimes is undertaken by private corporations or associations, with or without the sanction or backing of the public authorities.

The planning of undeveloped and suburban areas may have one or more of several objects:

a) To keep outlying districts in harmony with a central area already well planned, as, for instance, in Washington, D.C.
b) To make the new development superior to a wrongly planned central area
c) To provide beautiful homes for the rich and well-to-do
d) To depopulate the slums and provide healthful environment for the poor
e) To house the employees of particular factories or works

26. THE CITY-PLANNING MOVEMENT[1]

In securing a removal of factories to the outskirts, town planning has the opportunity—as already indicated—of putting them where they will do least injury to the community. That is to say, in the arbitrary creation of a factory district there must be consideration not only of transportation opportunities—a feature which it is comparatively easy to control—and of general healthfulness of locality, but also of the proposed position in its relation to the existing city. The factories should not be put where the prevailing wind will carry their smoke into the city, where their location checks the natural growth of high-class residence districts, or where the heavy teaming incident to their operation is compelled to make use of expensively developed avenues. Finally, in large towns more than one industrial district should be planned, lest—even with suburban location—residential congestion result.

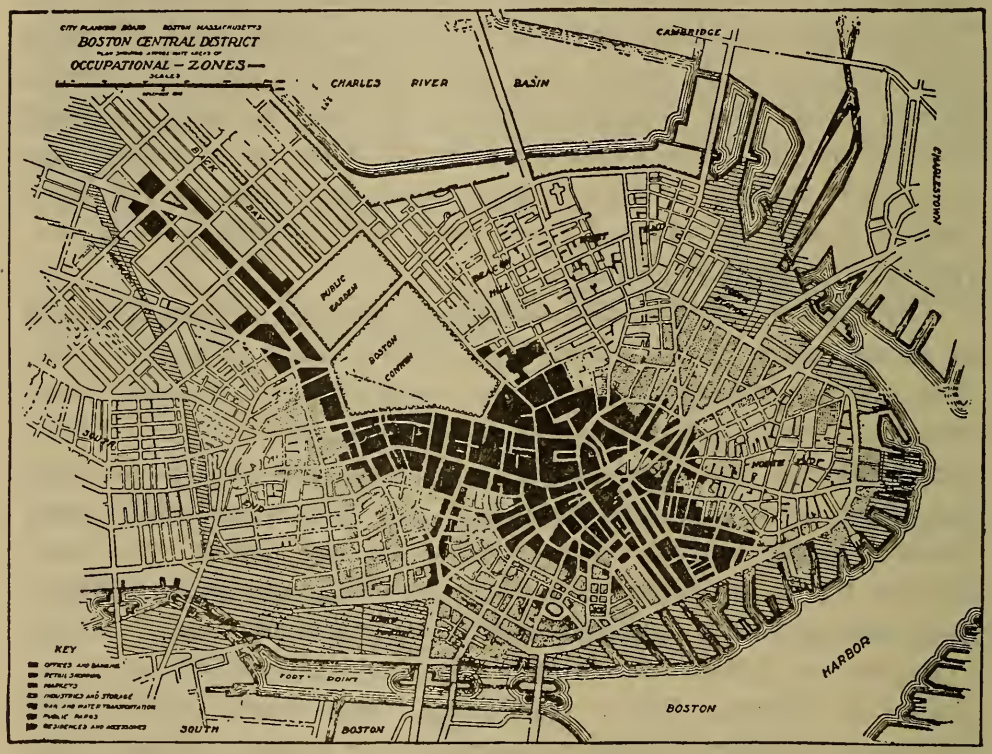
The present city-planning movement has been preceded, as well as accompanied, by not a little thoughtful platting of limited areas, done in a comprehensive way by the manufacturers themselves, when they have established their plants on the outskirts of cities. Of their own initiative, they have sought by such platting to gain for their employees, as well as for themselves, the advantages which town planning ought to give. For example, Leclaire, Illinois, the town built by the N. O. Nelson Manufacturing Company, is characterized by "winding roads, bordered with spreading shade trees." Other examples are Echota, the town of the Niagara Development Company, at Niagara Falls; Coldspring, New York (the Cornell Company); Gwinn, Michigan (a mining town of the Cleveland-Cliffs Iron Company); Plymouth, Massachusetts (tract developed by the Plymouth Cordage Company); and Wilmerding and Hopedale.

In 1909 Los Angeles created by ordinance distinct residential and industrial districts, decreeing that certain kinds of business should be excluded from the former, even though they had been already established in the designated area. This very radical action was subsequently upheld by the Supreme Court of the state. Three years later the legislature of Maryland passed an act requiring that all buildings in a given section of Baltimore be detached. In that same year, 1912, Massachusetts amended its general municipal act so as to permit all of its cities and towns except Boston to regulate the

[1] Adapted by permission from C. M. Robinson, *City Planning*, pp. 175–79, 279–82. (G. P. Putnam's Sons, 1916.)

height, area, location, and use of buildings in any designated part or parts of their corporation limits. And the province of Ontario, Canada, gave to cities that had a population of 100,000 or more authority to control the location of apartment and tenement houses and of public garages.

In 1913 there was a wave of districting legislation. New York State authorized the Common Council in the six cities of the second



Map Showing the Existing Downtown Zones in Boston[1]

Black—Offices and banking. Dotted—Industries and storage.
Hatched and dotted—Rail and water transportation.
White—Residences and accessories.

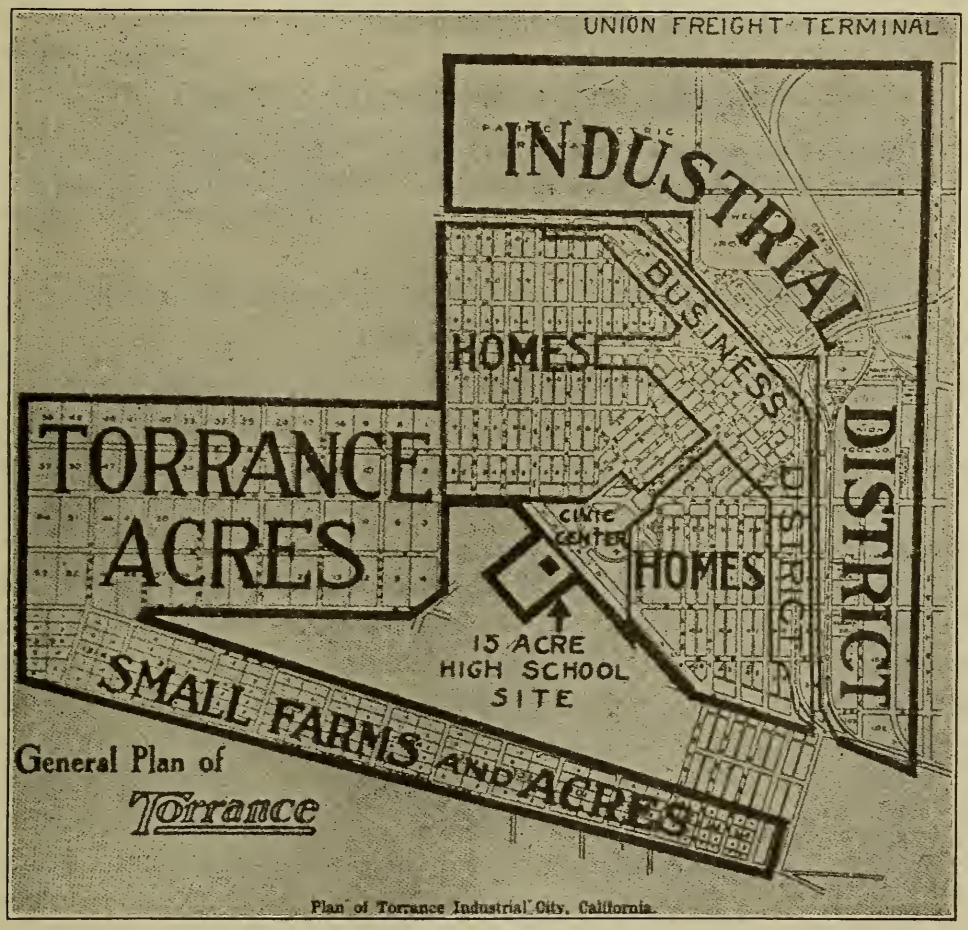
Compare this with the map of Torrance. Just what significant differences are there?

class, on petition of two-thirds of the owners affected, to establish residence districts in which only single or two-family houses may be constructed. Minnesota in that year passed an act empowering Duluth, Minneapolis, and St. Paul to establish residential and industrial districts, on petition of 50 per cent of the property owners in the affected section. Any kind of business, and even tenements,

[1] Adapted from *The North End*, a report of the City Planning Board of Boston.

apartment houses, and hotels, may be excluded from the residential district. Wisconsin authorized its eight cities of 25,000 or more population to set aside "exclusive" residential districts. Seattle included the possibility of restricted districts in the building code adopted by it in July, 1913.

In 1914 the legislature of New York amended the Board of Estimate and Apportionment to "divide the city into districts of such



Map Showing the Zones Established in Advance for Torrance, Near Los Angeles, California

number, shape, and area as it may deem best suited" for a regulation of "the height and bulk of buildings and the area of yards, courts and other open spaces," and it gave to the board permission to make these regulations different in different districts. The board was given authority also to "regulate and restrict the location of trades and industries and the location of buildings designed for specific purposes,"

and to "divide the city into districts of such number, shape, and area as it may deem best suited to carry out" such purpose.

While it is true that new laws are constantly added and new forward steps continually taken, it has seemed worth while to run over this legislation because it so clearly shows the trend. It seems to give assurance that in America districting has come to stay, that it will grow in thoroughness, and thus that city planners will have this added authority which may be of such value in facilitating the adaptation of towns and cities to their functions.

REFERENCES FOR FURTHER STUDY

Shaw, *An Approach to Business Problems*, chap. iii and pp. 115–25.
Jones, *The Administration of Industrial Enterprises*, chaps. iii and iv.

CHAPTER III

THE ADMINISTRATION OF PERSONNEL

Purposes of this chapter:

1. To secure a bird's-eye view of modern methods of personnel administration.

2. To appraise these methods in terms of their contribution to good output and to right social living.

3. To see the relationship of personnel administration to the other aspects of administration.

A. Introductory Survey of the Content of the Manager's Relationship to Personnel

The manager's administration of his personnel problems is a topic which may rightly lay claim to much space in our treatment of managerial control. Someone has well said that industry is made up of *persons working with things* and that it is even more important to utilize the persons properly than it is the things, since man is the goal as well as the chief agency of industrial activity. In this statement, it should be observed, two arguments are present, at least by implication. One is that attention to personnel problems in modern industry is justified as a means of improving human relationships; as a means of producing *man*. The modern worker, so the argument runs, spends such a considerable proportion of his waking hours in the business plant that as a matter of social upbuilding the plant must assume certain obligations which were in a simpler society discharged by the home, the guild, or the market place.

No doubt there is merit in this contention. We cannot, however, close our eyes to the fact that modern industry is organized for profit; and we must remember that we are just now engaged in a study of managerial control of modern industry. We turn, therefore, to the second argument which is implied in the statement that it is highly important to utilize properly the persons who work with things in modern business. This second argument is that it pays; that it yields gains over and above the costs; and that the manager should therefore engage in personnel activities as a business proposition.

It is our task in this chapter to look into both of these arguments, but especially into the latter. It will facilitate our study if there is before us from the very start a brief statement of the method we shall use.

1. Since modern management is of necessity specialized, let us assume that there exists in the typical business organization a separate department charged with the administration of personnel. This is by no means true of all concerns and particularly it is not true of small ones. The *problems* are present, however, even if no separate department has been set up, and it will quicken our discussion if we free ourselves from attention to details of business organization and concentrate upon the problems always at issue, no matter what the form of organization may be. We assume, therefore, as a means of facilitating discussion, that the manager's administration of personnel is carried out through a personnel department.

2. Since our survey must at the best be a rapid one, it is inexpedient to try to master the multitudinous "practical" technical aspects of personnel administration. Rather let us confine ourselves mainly to an attempt to see the larger problems which are to be solved and the materials which are available for their solution. Such a study will cause us occasionally to look at various phases of personnel practice, but these occasional glimpses will be for purposes of illustration, or of sampling, rather than for the purpose of mastering technique.

Perhaps the statement of purposes at the opening of the chapter might be paraphrased thus: (1) To get an appreciation of the range and character of the problems which confront the personnel manager and of the kind of an organization which may wisely be set up to meet these problems. (2) To see the problems of labor administration (*a*) in terms of incentive and output and (*b*) in terms of the economic order. (3) To get a broad survey of the apparent trends in labor administration and particularly to survey the advances being made in scientific methods in this field. (4) To become sufficiently aware of the ramifications of labor administration to show us what fields of study will be useful in this connection in our later training for business management.

Section A (pp. 115–26) of our study will be devoted to a general view of the functions performed by the modern personnel department and of the functionaries who do the work. The purpose of this section

is that of introducing the student to the subject-matter of the chapter in such a way that he may from the beginning think of it as a whole and not as a series of isolated sections. Sections B (pp. 127–53) and C (pp. 153–92) view personnel activities in terms of incentive and output, thus recognizing the challenge of "does it pay?" Section D (pp. 192–226) gives us a glimpse of certain materials which are available for the solution of personnel problems. It emphasizes those aids which objectify the issues and facilitate scientific approach to the problems. Section E (pp. 226–42) discusses the place of the personnel department in the business organization as a whole.

Our first task, then, is an introductory survey of the content of the manager's relationship to personnel.

PROBLEMS

1. "It is even more necessary carefully to compute the labor requirements and closely to analyze the status of the working force than it is to check up the physical materials that go into production." Is this an extreme statement of the case? Why or why not? Can one determine which is "more necessary"?
2. "It very early became evident that exact methods could not be carried out successfully in a factory where the personnel was chosen at haphazard or was constantly changing." Why not?
3. A large steel corporation is reported to have advertised recently for seven hundred common laborers and to have laid off one thousand in another department the same day. How was this possible? How could it be avoided?
4. One writer has classified "The usual reasons for leaving employment" as follows:

   Voluntary, because of { work / pay / personal reasons }

   Involuntary because { laid off for { business or seasonal fluctuations / discipline } / discharged on account of { unfitness for work / personal character } }

   How could a central employment department eliminate or minimize any of these?
5. "The principal losses to employers from changing employees may be expected to fall under some one of the following headings." Supply the headings. What ones could a personnel department eliminate? What ones could it minimize?

6. "The function of the employment department not only consists of selecting and engaging help but also covers the broad field of the efficiency of the personnel. Of course there are manifold ways of doing this." What are some of them?
7. At the Clothcraft Shops about one-fifth of the total number of employees are said to come daily into contact with the employment and service department. Make a list of the ways in which they come into contact.
8. "Many firms have included under labor costs expenditures for wages only. Scientific study has revealed other labor costs in addition to wages." What others? Do these other costs go far to justify a personnel department?
9. If a plant is located in a town where recreation, health, education, and home conditions of the people are adequately cared for, and the workers in the plant seem contented and working to their full capacity, is there need for a personnel department?
10. Which is dealt with in personnel work, the mass or the individual?
11. Is personnel work designed to reach skilled labor? Unskilled labor? Management?
12. "It may be argued that a small industry cannot afford an employment department and that even in the larger industry, while it may be needed in times of labor scarcity, it is not warranted in times of business depression or in slack seasons." Do you agree?
13. "In the coming years—now, in fact—men more than things must engage the most thoughtful interest of employers." Give reasons for and against.
14. "Employers no longer hire men; they buy labor like any other commodity." What does this mean? Is it true?
15. "Machinery plays such an important part in the processes of today that, important as labor is, the manager can well afford to give his main attention to efficiency of machinery." "In these days of indirect costs, it is more than ever necessary to give heed to the labor element." With which quotation do you agree? Why?
16. Why do employers engage in welfare work? Is it to furnish incentive to labor? Is it on humanitarian grounds? Is it because it pays? Are there other possible reasons?
17. Should a personnel manager be most proficient in (*a*) the handling of men, or in (*b*) technical knowledge and plant organization, or in (*c*) something else?

1. ORGANIZATION OF THE PERSONNEL DEPARTMENT[1]

The personnel department represents the employment interests of the company and acts for those interests in all affairs that affect the people in its employ. Where it is the case that employees them-

[1] Adapted by permission from Ordway Tead and H. C. Metcalf, an unpublished manuscript, and also *Personnel Administration* (McGraw-Hill Book Company, Inc., 1920).

selves are represented either by unions, by shop organizations (e.g., a co-operative association or mutual-benefit association) or by both, it is the duty of the personnel department to represent the employing interests of the company, as distinct from the other interests (producing, selling, and financial) in mutual deliberations.

This statement might seem to indicate an anomalous position of dual loyalty and divided interest. This is not the case. A department head's anxiety for the success of his department does not run counter to his loyalty to the whole business—rather the contrary.

The organization, powers, and activities involved in carrying out this work are described below. It cannot be too clearly urged that, although the several duties are described as if they devolved upon separate individuals, this need not necessarily and often would not be the case. But since the functions are different and distinct, they are here so separated for the purpose of complete clearness. The size of the personnel department will naturally depend entirely upon the size of the concern. Indeed, in a factory of from one to four hundred employees, one or two people can, at least at the outset, perform the work involved in a right-functioning personnel department.

1. *The personnel manager.*—This is an officer of major managerial rank who is responsible for the work herein described.

2. *The organization committee.*—The organization committee is composed of those responsible for the handling of all elements in the personnel problem. Its purpose is to draw up and submit plans for the development of the whole organization on its distinctly human side.

3. *The personnel committee.*—The plans of the organization committee are submitted to a personnel committee, composed of representatives of the several departments in a concern in order that there may be the broadest knowledge and fullest discussion of proposals looking to new method and practice in the handling of all personnel problems. In this way only is the fullest consent of all forces in a business secured for these developments.

4. *The board of personnel directors.*—This consists of: (*a*) the director of employment, (*b*) the director of training, (*c*) the director of research.

5. *The employment division* (under the director of employment). —The work of this division is most effective where its director has entire authority and responsibility in regard to the duties listed. It

has sometimes been found wise, however, to begin by giving him in some matters only advisory or recommendatory powers. These are enlarged into complete authority as soon as this separate department devoted to personnel problems proves its capacity to handle them. The director should from the start be given as much authority as the situation will wisely permit.

The activities are stated below as they would be when the division has attained its full authority:

a) To develop all available sources, both within and without the plant, for possible employees. This involves a thorough knowledge and cordial working relationship with a great variety of people and institutions which come in contact with people available or capable of becoming available for work. The systematic cultivation and extension of these resources is indispensable if the concern is to have capable workers to select from.

b) To select employees along lines laid down by the research division in the light of thorough knowledge of the requirements of the job.

c) To assist new employees in starting at work so that they will be subjected to the minimum of delay in adjustment and in learning the duties.

d) To maintain a steady and competent working force by watching for and seeking to eliminate possible causes of dissatisfaction and friction; and by hearing and seeking to adjust all grievances among employees or between employees and the company, unless there is some other organized way of handling these matters, such as a shop grievance committee.

e) To make a periodic study (e.g., every three or six months) of the work or work records of all employees so as to have all possible facts on which to determine advisability of change in rate of pay or in the position held.

f) To have charge of advancing employees on probation and of making promotions and demotions.

g) To have charge of such transfer of workers between departments as will lessen labor turnover and facilitate production.

h) To lay off and discharge employees when necessary.

i) To receive and decide all requests for wage increases unless there are wage boards which handle these matters. In this event, the employment division is represented on the wage boards.

Thorough knowledge of the pay-roll as a whole and in detail and of the financial situation and policies of the concern is an essential requisite to the making of these decisions.

6. *The training division* (under the director of training).—The activities of this division should be carried out with the realization that anyone who is earning a living is mature, self-reliant, and responsible enough to make it unsound to attempt any autocratic methods of training. The aim should rather be to help each employee to a knowledge of his own ability and latent capacity and of the opportunities within the business, and to help him develop himself either for those opportunities or for others outside the business where his talents may have fullest play. If it is clear that a business offers a very limited field for promotion, this attention to outside avenues of advancement may very well become a source of strength to the business, since it will attract ambitious people.

As intimate a knowledge as is possible of the personality and working ability of each employee is clearly a prerequisite to this work.

This division is to outline and administer a comprehensive plan of training:

a) To help employees to train themselves to work more efficiently.

b) To help them fit themselves for promotion.

c) To help them fit themselves for other work to which they may be transferred.

d) To direct the training of executives and of all employees who instruct other employees.

e) To compile and bring to the attention of each employee such information as to the operation of the plant as will lead to its smooth running.

f) To co-operate in the prevocational training of school children and in the training of part-time workers.

g) To promote and co-operate with efforts to establish public and private schools that design to fit children more adequately for industry.

7. *The research division* (under the director of research).—The research division conducts such study as is necessary to give the maximum effectiveness to the work of employment and training. It also makes such studies and keeps such records as will render permanent and available the facts about the operation of the plant that are vital in their direct or indirect effect upon the people employed. It is the constant aim to study the structure of the business and the

facts of human nature in order that the workings of the two shall be as nearly in harmony as possible. This involves the following work:

a) Thorough study of the actual work in each job both by itself and in its relation to the whole organization. A comprehensive job analysis includes not only a description of the actual processes but also the effect upon the job and the workers of all the human and material elements which are involved. (See the nineteen heads of *The Labor Audit.*) A final aspect of job analysis is an organization chart of the concern which it is the duty of the research division to formulate and keep corrected to date. Job analysis is the essential basis for careful selection of employees.

b) Selection and statement of standards for new employees (or for old employees at new positions); e.g., standards of health, age, intelligence, working capacity, etc. A thorough statement of the qualifications for each job is a direct outgrowth of the job analysis.

c) Development of technique to select employees who will meet the standards set. This would include study of: (1) methods of meeting applicants; (2) form of application blank; (3) additional questions to get indications of the applicant's character and personality.

d) The development of clear lines of promotion. If it is the policy of the company to promote to certain positions from within, the lines of promotion should be made plain to all employees.

e) The formulation of adequate record systems to show: (1) the amount and cost of labor turnover (hiring and firing), giving in proper detail the causes by departments; (2) the relation of the number of workers and the character of their work to the volume of production; (3) the achievement of each worker, together with statements of errors, waste, "seconds," breakage, etc.

f) Keeping in permanent and accessible form *the perpetual labor audit* under the following heads: (1) physical working conditions—safety, health; (2) turnover and regularity of employment; (3) work analysis; (4) sources of labor supply; (5) methods of selection; (6) starting at work; (7) training; (8) labor policies, economic beliefs; (9) employers' associations; (10) employees' associations; (11) unions; (12) organized joint relations; (13) labor legislation; (14) labor decisions by the courts; (15) labor law administration; (16) relation to community interests; (17) form

and efficiency of management in so far as it constitutes a labor problem; (18) amounts and methods of pay; (19) living plans: (*a*) savings; (*b*) provision against loss from illness; (*c*) provision against loss from accident; (*d*) provision against loss from unemployment; (*e*) pensions; (*f*) life insurance; (*g*) opportunities for purchasing at fair prices; (*h*) housing; (*i*) health; (*j*) recreation; (*k*) education.

g) Where determining boards are in operation, the representative of the research division is on each determining board by virtue of the fact that his division made the initial analysis of the job.

h) There should be an exhaustive collection of successful experiments and achievements in the whole field of activities under the personnel department. This industry-wide study should look especially toward finding remedies for discrepancies or problems that *The Labor Audit* reveals in the plant.

8. *Other activities of the personnel manager.*—In aiding the concern to meet the human elements in its problem, the personnel manager has the following duties:

a) To keep in touch with the foremost thought and experience of the day in regard especially to headings 8–19 of *The Labor Audit*, and to stimulate the management to constant knowledge and advance along those lines.

b) To urge the improvement of the existing forms of organization and the adoption of new forms, both in the entire concern and in each of its parts; to make clear that any organization is inefficient in the long run if it suppresses or conflicts with the fundamental characteristics of human nature.

c) In many concerns questions of safety and health have become recognized as so important that an outline of the duties of the personnel manager is no longer complete without the statement that in addition to the three divisions outlined here some plants will find it necessary to establish a safety division and a health division. The larger the share of the employees in the management of these divisions, the sounder will be their basis and the more permanent their results.

See also p. 236. The Place of the Personnel Department in the Business Organization.

2. FUNCTIONS OF THE PERSONNEL

PERSONNEL

Composed of the Direc-

Object of Department: To Create an Effi-

EMPLOYMENT STAFF
Manager
Interviewer
Stenographers
Filing Clerk
Job Analysis and Grievance Man

MEDICAL AND SURGICAL STAFF
First Aid Chief and Two Assistants
Directing Physician
Surgeon
Specialists

SAFETY AND SANITATION STAFF
Safety Engineer
Sanitary Inspector
Stenographer

PROPER SELECTION BY
a) Careful interview
b) Study of past record
c) Physical examination
d) Knowledge of job analysis

INSTRUCTIONS TO NEW EMPLOYEES
a) Introduction
b) Rules and Policies
c) Location and use of First Aid
d) Location of main building and shops
e) Locate conveniences
f) Badges and Locker keys

INTERVIEW ALL LEAVING EMPLOYEES
a) To approve discharge
b) To check up foreman's reason
c) To insure impartial hearing

KEEP DETAILED TURNOVER RECORDS
a) To aid turnover control
b) To verify inability to promote
c) To detect adverse home conditions
d) To rectify absenteeism, tardiness or grievances
e) To aid detection of sickness or accidents

Knowledge of Sources
Knowledge of Plant needs
Knowledge of hours of work
Knowledge of wages
Knowledge of work conditions
Transfers and Promotions
Keep adequate individual records
Furnish state or federal records

GENERAL HEALTH
II. Committee Service
1. Sanitation
2. Shop
III. Community
Co-operate with civic bodies
Physical examination of applicants
Periodical examination of defectives
Periodical examination of employees exposed to extra hazards
Advise Employment Bureau in placement of defectives
Treatment of accident cases
Treatment of medical cases
Vaccination and Inoculation as prevention against epidemics
Investigation of absence
Furnish Employment Bureau with data on employees leaving on account of ill health
Keep adequate examination and treatment records
Administer fatigue rules
District sanitation
Plant sanitation
Medical advice and assistance to families
Health lectures and printed matter to employees
Special district control in epidemics
Constant educational work in general health

ACCIDENT REDUCTION BY
a) Education
b) Safeguarding hazards
c) Committees Inspections
d) Investigation of all accidents

REGULAR PLANT INSPECTION BY
a) Safety Engineer
b) Members of Safety Committee

SUPERVISION OF SAFETY
a) Drinking water supply
b) Lighting
c) Heating
d) Ventilation
e) Toilet and Locker rooms
f) Janitor service
g) General sanitary conditions
Report all accidents to Insurance Company
Co-operate with Employees and Medical Bureaus in shortening periods of disability
Facilitate compensation payments
Keep adequate records
Reduction of occupational disease hazards. General supervision of working conditions from safety standpoint
Co-operate with Fire Dept.

[1] Prepared by C. H. Fenstermacher for *Personnel*, I (1920), 1, 4–5, 8–9. scope of personnel work in a modern industrial plant.

PERSONNEL DEPARTMENT[1]

MANAGER

COMMITTEE

tors of Each Bureau

cient, Healthy, Stable Body of Employees

EDUCATION AND TRAINING	RESEARCH STAFF	SERVICE STAFF
Staff Instructor Editor Purpose: Training and development of the workers	Special Investigators	Assistant Personnel Superintendent Recreation Director Supt. of Property Social worker Stenographer

Prepare Dept. Manuals Bulletin board messages Follow up on employee service record Individual assistance Specialized health instructions Build Library Selection of current magazine articles, for distribution House Organs Hand Book Literary and Educational Clubs Instruction for Shop control Co-operation with local educational organizations Class work High Schools Colleges Y.M.C.A. Unions in apprenticeship courses Co-operate with others in getting across to men, aims and purposes of each bureau Noon Day and Evening mass meetings Motion Pictures Special courses for Refining Groups, Messengers, Clerical, Mechanical and Technical foremen Musical features Choruses, Orchestras, Bands Kindergarten Conduct Suggestion Box	Job analysis studies Standard wage rate studies Cost of living studies Chart lines of promotion Investigate grievance causes Departmental courses assembled for study	HOUSING PROBLEMS *a*) Company houses *b*) Rented houses as to rate and service given *c*) Rooming houses COMMUNITY SERVICE *a*) Advance Legislation *b*) Public recreation *c*) Public health and sanitation *d*) Public education LEGAL AID *a*) Notary Public *b*) Investments *c*) Public Libraries PLANT OR COMPANY SERVICE *a*) Develop Women's Clubs and groups *b*) Develop Men's Clubs *c*) Develop Shop Committees *d*) Assist in directing employees' civic activities, viz: Social Moral Recreational, and Educational Supervise recreation Employees' stores Lunchrooms Garden activities Supervision of Group Insurance Supervision of Thrift Campaigns

This selection is worthy of careful study. It gives a comprehensive view of the

3. ANOTHER STATEMENT OF FUNCTIONS[1]

Labor Supply

Recruiting
1. Interviewing
2. Investigation of Past Records of Applicants
3. Physical Examinations
4. Mental Tests
5. Trade Tests
6. Assignment to Work
7. Setting Entrance Wage Rates
8. Identification Badges, Clock Cards, Tool Checks, Locker Keys

Developing the Sources and Channels of Labor Supply
1. Outside Sources
2. Sources within the Plant

Training and Occupational Adjustments

Adjustments
1. Ratings of Employees
2. Transfers
3. Promotions
4. Wage Increases
5. Discipline (Individual Cases)
6. Discharge
7. Recommendations to Other Employers

Training
1. Introduction and Follow-up of New Employee
2. Booklet of Rules and Information
3. Vestibule School
4. Apprentice Course
5. Part Time or Co-operative Training
6. Shop Instructors
7. Special Courses for Special Groups, as for Minor Executives, Clerical Workers, or Foremen

General Education
1. Hygiene
2. Safety
3. Sanitation
4. Americanization
5. Evening Classes in Academic or Technical Subjects or Arts and Crafts
6. Clubs and Committees
7. Plant Journals
8. Bulletin Boards
9. Lectures and Concerts
10. Special Instruction and Assistance for Special Groups, as for Gardening, First Aid, or Firemen
11. Legal Aid
12. Thrift
13. Co-operation with Community, State, and National Educational Agencies
14. Library
15. Visits to Other Plants or Other Departments
16. Arrangement for Attendance of Employees at Meetings of Trade and Technical Organizations, or of Employment Management and Educational Associations

Labor Maintenance

Group Relations
1. Shop Committees
2. Reduction of Absenteeism and Tardiness
3. Complaints and Grievances
4. Shop Order
5. Teamwork and Inter-Departmental Co-operation
6. Relations with Labor Organizations
7. Introduction of New Policies or Revised Standard Practice
8. Bulletin Boards

Health and Safety
1. Sanitation (Heat, Light, Ventilation, Supervision of Lockers, Toilets, Cleaning, etc.)
2. Safety
3. First Aid and Hospital
4. Fire Hazards
5. Occupational Hazards (Dust, Fumes, Posture, etc.)
6. Rest Rooms
7. Co-operation with Local Health Officers

Co-operative and Service Activities
1. Restaurant
2. Housing
3. Transportation
4. Recreation
5. Medical Aid (Physician, Dentist, Oculist, Nurse, Visiting Nurse, etc.)
6. Insurance and Pensions
7. Athletics
8. Co-operative Store
9. Loans
10. Gardening

Legend
---------Co-operation or Borderline Activities
———Clearly Defined Functional Line

Records and Research

(Some of These Functions Are Exercised in Direct Connection with Each of the Divisions Outlined Above. Others Are Separate Activities Intended to Supply the Fact Basis upon Which Standard Practice May Be Modified or Additions to the Work of the Employment Department May Be Proposed.)

1. Individual Reference Records Containing Essential Data: Identification, Previous Experience, Education, Physical Examination, etc.
2. Individual Progress, Production, Health, and Accident Records
3. Causes of Sickness, Accidents, Absenteeism, Tardiness, Grievances, Voluntary Leaving, Discipline, and Discharge
   Analyzed by Jobs, Departments, Machines, Wages, Race Groups, Working Conditions, Age, Length of Service, Sex, Other Significant Factors
4. Investigation of Hours of Labor and Fatigue
5. Study of Losses through Seasonal Production, Waste Material, and Idle Machinery
6. Standardization of Occupations
7. Grading Jobs and Equalization of Wage Rates
8. Job Specifications for Requisitions and Hiring
9. Job Analyses for Training, Promotion
10. Charting the Organization, Definition of Executive Functions, and Reorganization of Standard Practice for Specialized Use in Selecting, Training, Promoting, and Transferring Employees or Employment Matters
11. Standardization of Physical, Mental, and Trade Tests
12. Reports to City, State, or National Authorities Regarding Employees or Employment Matters
13. Co-operation with Outside Agencies in Making Investigations
14. Special Studies and Surveys for Introduction of New Policies or Modification of Practice
15. Cost Accounting to Show Economic Limitations of Employment Department Activities

[1]Taken by permission from R. W. Kelly, "Functions of the Employment Department," *Industrial Management*, LIX (1919), 477.

B. Personnel Administration in Terms of Incentive and Output: Good Physical Conditions and Competent Human Machines

The events of recent years have brought out into clear relief the fact that it is important to have men work together effectively; that output, abundant, well-balanced output, is of vital interest to society. Now this is not a new truth. Output always has been and always will be essential to the onward march of society; output, not solely of material goods like shoes and potatoes, but also of services such as those of the artist or the physician; output directed not alone to the gratification of what we call, loosely enough, our material wants, but directed as well to the development of all the finer qualities of heart and mind. Output is important to the progress of society as a whole. Properly controlled, it is important to the progress of every class of society. It is, furthermore, a *sine qua non* of business success, barring what we like to think are abnormal and exceptional cases such as predatory or monopolistic businesses.

Notwithstanding all this, no fact is more patent today than the ineffectiveness of businesses in this very realm of output. Who is responsible for this ineffectiveness? Part of the responsibility rests upon labor with its feelings of enmity toward capital, its suspicions and fears and distrust, its lack of initiative, its mental laziness, its lack of vision concerning the real issues of the case, its limitation of output, its occasional surrender to poor leadership. So also part of the responsibility rests upon capital and management with their feeling of enmity toward labor, their suspicions and fears and distrusts, their lack of initiative, their mental laziness, their lack of vision concerning the real issues of the case, their limitation of output, their occasional surrender to poor leadership. As between the two parties, the greater responsibility rests with capital and management, for after all, they hold the directing power. It is their function to make researches into the problem; to plan effective organization; to develop appropriate incentives; to serve society as responsible stewards.

And, unfortunately, part of the responsibility rests with our whole modern organization of society. In our impersonal knitting together of specialists, it is easy for distrust and fear and suspicion to arise; easy for each party to believe that it contributes more to the common weal and receives less return than does the other party; easy for beliefs to solidify into prejudices. We have done little to combat these prejudices. We have done little to instruct the modern

specialists concerning their place and duties in society. There is almost no such instruction on how our society is put together in our public-school system, which is our main reliance in such matters. As for instruction within the walls of industry, foreman-training courses are mainly courses in production technique, and other courses which deal with more than production technique are in their infancy. We have hardly made a beginning of getting men *to see how* they work together, and surely this vision must precede their working together effectively.

Then, too, the organization of our society upon a competitive, gain-spirit basis, valuable in the main, leads to short-sighted policies and to confusion of issues. It is not infrequently true that gains to individuals flow from limitation of output and from other acts harmful to society. It is not infrequently true that short-sighted quest for gain leads to disregard of long-run human values. These seem to be penalties attached to our pecuniary organization of society. True, they are penalties which can be lightened or even abolished by effective social control, but we have, not unnaturally, developed a healthy suspicion of the effectiveness of our instruments of social control. Too commonly, social attitudes are manufactured; too commonly, supervision is stupid, negligent, or even harmful; too commonly, public service is prostituted to private gain.

There is always a mournful interest in attempting to decide which is blacker, the pot or the kettle, but that alone is a futile performance. Our survey of the responsibility for inadequate output was undertaken, not to place blame, but to see, in perspective, the task of the personnel manager who realizes that his function is that of aiding in getting men to work together *effectively*. He must understand the causes of inadequate output. He must set himself to the determination of the conditions of good output and then to the realization of those conditions, so far as in him lies.

There are, of course, many possible ways of stating the conditions precedent and prerequisite to good output, and they obviously vary from case to case. Assuming as a type case a manufacturing and selling business, there is submitted the following tentative formulation of these conditions. There should be:

1. Good physical location and good physical plant and equipment, both from the point of view of mechanical processes and from the point of view of their relationship to the workers.

2. Good "human machines" both physically and mentally. This, of course, includes necessary training, and it applies to management as truly as to workers.

3. Good development of "the will to do" in these human machines—which makes them far more than machines.

4. Good organization and administration, or control, or effective bringing together of persons and the things with which persons work.

5. Good social environment, including in that term, not merely social attitudes and government, but also all economic and social institutions—the church, the school, the place of amusement, the trade union, the banking system, and a legion of others with which the manager must work.

It is the point of view of this chapter that the personnel manager, maintaining always his responsibility for broad social values, must justify his position in the business firm by his contribution to output. The five conditions precedent to good output which have just been mentioned are accordingly matters in which he has a vital concern. The first two of these conditions are considered in the present section. The third is taken up in section C under the caption "Personnel administration in terms of incentive and output: the will to do" (see p. 153). The fourth is treated (with particular reference to the personnel department) in section E "Organization and administration of the personnel department" (see p. 226). The fifth does not receive formal treatment except in respect to its relationship to developing "the will to do" and to the spirit of personnel administration.

Space permits only a "sampling" method of treatment of the two (good physical conditions and competent "human machines") conditions precedent to good output which are taken up in this section. The student's mind should range out beyond the samples given. He should also be alert to see in these selections matters which bear upon problems considered in more detail in later sections.

PROBLEMS

1. "The present methods of factory management do not secure a high degree of labor efficiency." Why not?
2. What are some of the factors within an industrial plant which serve to reduce output? Which of these can the manager eliminate or minimize? How?
3. It is said that employers supported the safety-first movement because of pecuniary motives. Explain how this would be possible.

4. "It doesn't pay the management to care for physical health of workers and to prevent accidents. It is cheaper to 'scrap' the unfit and get new ones." Draw up a table showing factors of cost for and against this position.
5. "Safety engineering is a misnomer. Propaganda is a better term." What is the point to this statement?
6. The most remarkable development of safety engineering would not entirely eliminate accidents. Who should bear the cost of these unpreventable accidents? Why?
7. "The prevention and cure of illness is essentially a community and not an industrial problem." Grant this. Does it relieve the manager of responsibility?
8. "The progressive employer will be ahead of both legislation and current practice in safeguarding workers against disease and accident." Why? Will it pay? If you think so, show precisely how.
9. Draw up a statement of the function of social insurance. Should the manager be interested in such matters? If so, why and how?
10. Show wherein the personnel manager is interested, *as a business man*, in the issues raised in questions 7, 8, and 9.
11. "Technical skill and mental ability do not necessarily coincide with perfect health." Does this fact discredit the physical examination?
12. "Output is in direct ratio to the length of the working day." Of course, this is not true, without limit. What are the limits? Will they vary from industry to industry?
13. "Talk of losses due to fatigue in modern industry is badly overdone. High specialization and the use of automatic machinery cause output to keep up, no matter if the workers are greatly fatigued." Comment.
14. "Rest periods are a very useful way of reducing accidents in an industry where the strain is great." Why?
15. What are the principal means used to reduce physical and nervous strain in industry? Are they universally used? Can you suggest any that might be but are not now used?
16. "The essentials of daylight illumination, as summarized by Dr. Scheres-chewsky, are (1) the amount of light admitted to the interior should be as large as possible. (2) The light should reach the center of the room. (3) The distribution of the light upon the working planes should be as uniform as possible. (4) The light should fall upon working planes from a proper direction. (5) The walls and trim of the room should be of such color and surface as to absorb but little of the light, white being the preferable color. (6) Manufacturing and other equipment should be so disposed as to avoid casting extensive local shadows." Wherein is the personnel manager interested in illumination problems?

17. "It is at least questionable whether the employer has any right to follow the employee home from the factory and intrude on his domestic and social life, nor should there be any need in a city of size and decent government." Discuss.
18. "Poor housing conditions are factors in impairing the health and morale of the worker, in lowering efficiency, in breeding discontent, in retarding production, and in increasing labor turnover." Do you agree? Can the personnel manager do anything to help the situation?
19. "It is inevitable that labor should retard any effort to develop human machinery which is made without its consent and its own tangible reward in view." Do you agree? What can the manager do about it?
20. "All this welfare work is nonsense. If the manager would only stop it all and add its former cost to wages, both industry and worker and society would gain." Comment.
21. "Problems involved in securing and holding an efficient working force reveal the futility of leaving their execution to detached foremen. They include: (1) mobilizing the sources of labor supply within and without the plant; (2) analyzing and classifying the requirements of the jobs of the entire plant; (3) selecting and placing applicants for work according to their physical, mental, and temperamental fitness for the specific job; (4) inducting and 'following up' the new employee until adjustment is complete; (5) retaining and developing the old employee." Discuss the relative abilities of the foreman and the personnel manager to deal with these matters.
22. What are some of the difficulties of newspaper advertising for help from the point of view of (*a*) the worker, (*b*) the manager?
23. There has developed among manufacturers considerable opposition to having a United States employment service in the United States Department of Labor. Can this be because such a service could not be made worth while?
24. Confining your attention to the employment and placement activities of the personnel department, what items of cost can such a department reduce? What instrumentalities or technical devices will it use in the process?
25. Viewing the matter only as related to his costs, what arguments are there for a manager's conducting "general education" classes within his plant? For co-operating with public schools in continuation-school work? For conducting classes in sewing, drawing, personal hygiene, and domestic science?
26. Viewing the matter only as related to his costs, has the manager any interest in the public school system of his community? If so, is his interest confined to vocational education?
27. Would it be well (*a*) for society (*b*) for the manager, to have all technical training for all positions cared for in public schools?

4. SOME CAUSES OF INEFFICIENCY IN MODERN INDUSTRY[1]

The causes of inefficiency may be divided into three classes: The first are those causes which are chargeable primarily to the employer, the second those which are chargeable primarily to the workmen, and the third those which are chargeable primarily to our political and industrial system.

Those causes of inefficiency which are chargeable primarily to the employer may, in turn, be divided into two classes. Those of the first class arise from a lack of knowledge. They can be remedied by showing the management the possibilities of better methods. Those of the second class arise out of moral defects on the part of the employer, and will require more than a change in the system of management, or full information of the conditions of the plant in order to eliminate them.

The first and most prolific source of inefficiency is mental laziness. Most of us dislike to think. While a good many of us will devote a spare hour now and then to the consideration of some interesting subject, no man will, if he can avoid it, devote two hours a day, not to mention eight hours a day, to the task of devising and comparing methods of work. That kind of thing is entirely too strenuous to suit the average officer of administration. In the average plant, each officer places upon the shoulders of his underlings the burden of detail for which he himself ought to be responsible.

A second source of inefficiency is a dislike on the part of most managers to employ a considerable executive staff to direct the efforts of their workmen. The management balks at such a staff, and claims that "non-productive" labor is a necessary evil if you have to employ it, and an unnecessary evil if you can do without it.

A third fault of management is timidity. Capital seems to be ruled by fear quite as often as by judgment. Men dislike to risk their money in something which they feel is not absolutely sure to bring adequate returns.

This brings us to a fourth fault of management, which is lack of foresight. The management, in performing the work of today, fails to make allowance for the needs of next week, or the growth of next year. Plants grow in haphazard fashion. Equipment is added without making plans for the future. No attempt is made to insure that

[1] Taken from F. E. Cardullo, "Industrial Administration and Scientific Management" in *Machinery*, XVIII (1912), 931–35.

there will always be a corps of trained workmen and a staff of able foremen. The lack of definite and far-reaching plans for future work is not felt at the time that such plans should be made, but is felt later.

A fifth fault of management is one which may best be described as "mental inertia." Managers tend to follow methods which have been satisfactory in the past, but which changing conditions have made unsatisfactory for present requirements. Whenever a new invention of any importance is introduced into a shop, the conditions of work are greatly altered. The introduction of high-speed steel is a case in point. When the time required for machining work is cut down to a third of that formerly required, the amount of crane service for a given number of machines is trebled. The foundry and forge shops must be made very much larger in order to furnish the stock required by the machine-shop. The amount of storage room required for stock and for finished product is greatly increased. The relative importance of different items of cost is radically altered, and the nature of the problems of administration is greatly changed. Notwithstanding these changes, we will find that in most cases the management will attempt to get along with the least possible change in equipment, and in methods of work and administration. Many men resist change simply because it is change, in spite of the fact that the change may be desirable.

A sixth, and probably one of the greatest of all causes of inefficiency, is the fact that the management very seldom makes a careful study of the industry. In the few cases where a careful study is made, it is usually done for the purpose of improving the materials used or the quality of the output, or increasing the amount of work turned out by the use of a given method.

It is of equal or even greater importance that the methods themselves should receive the same careful study. Probably the best example of a scientific study of methods of manufacture is the work of Mr. Taylor on the art of cutting metals. It is probable that a similar study of methods would result in equally important developments in other lines of industry. Such studies are not made for three reasons. In the first place, managers do not realize the need of such studies nor the advances which are possible. In the second place very few men are capable of making such studies. In the third place, inertia opposes the changes which would result from such studies, and timidity hesitates to expend the money necessary to carry them out.

A seventh source of inefficiency in many industrial plants is the system of wage payment adopted. It would be hard to devise wage systems better calculated to limit efficiency than the two which are in most common use, namely, the day-wage plan, and the piece-work plan with frequent cuts. Under the day-work plan, the man receives no reward for his efficiency, he is instead punished for inefficiency. This is a method which is fundamentally wrong, and only to be employed when no other method is possible.

When a piece-work plan is adopted, the management usually knows very little about the possibilities of the work. If the management fixes what the men think to be a reasonable piece rate, the men will soon so increase their output that they will be making exorbitant wages. The management will then cut the piece rate, and after the men have experienced a series of cuts as a result of successive increases in efficiency, they will discover that the management does not propose to pay them more than a certain amount of money, and will work just hard enough to secure a trifle less than the maximum amount they can secure without experiencing a cut.

An eighth cause of inefficiency is one which is happily becoming less frequent. It is a disposition on the part of some employers to regard their workmen as being of a lower order of humanity than themselves. I have talked with such men on more than one occasion. Among their associates they were highly regarded for their kindness of heart, but I have heard them speak of their workmen as "beasts" and "ignorant brutes." No man who regards his employees in that light can be persuaded to adopt scientific management nor can he bring the efficiency of his plant to a high standard, because such feelings will unconsciously affect his attitude in dealing with his employees, arouse their antagonism, and destroy that feeling of co-operation which is the essential basis of high efficiency.

The last source of inefficiency of which I will speak is avarice on the part of the management. Avarice reduces wages, cuts piece rates, purchases inferior materials and equipment, employs unskilled labor, skimps on supplies, and makes unjust exactions of its employees. Avarice refuses to expend money for the collection of information, for increasing the facilities of work, and for improving the efficiency of administration. Avarice hampers the administrative staff at every point.

I have not by any means exhausted the list of causes of inefficiency which arise from faults of the management. It would be as

easy to name a hundred as to name nine, but the task is not agreeable. I have endeavored merely to point out the fact that such faults exist, that they can be remedied, and that before scientific management can be applied to an industry they must be remedied. While most of the causes which lead to inefficiency are chargeable to bad management, I would not have it inferred that the workmen are free from blame in the matter.

The first source of inefficiency chargeable to the workmen is their disinclination to work at any other than their natural pace. If a man is allowed to work as he pleases, he will soon settle down into a certain pace which suits his temperament and nervous organization, and will keep to that pace without very much variation from day to day.

A second source of inefficiency is lack of ambition. While most men will be stimulated by a proper reward, there are some classes of labor which cannot be reached in this way. Some workmen do not accomplish as much or as good work when well paid as they do when poorly paid. In certain sections of the South contractors find that when negro laborers are paid 75 cents a day they will work a full week, when paid $1 a day they will lay off one day in the week, and when paid $1.50 a day they will lay off half the time. The reason is that these men are not ambitious. It is needless to remark, however, that the average artisan is not of that character. He is ambitious and invariably responds to a suitable reward, unless he believes that in so doing he is acting against the best interests of himself or his fellow-workmen.

A third source of inefficiency lies in the fact that the workman does not like to think any more than the superintendent, the foreman, the manager, or the board of directors. He prefers to work without thinking when it is possible. Few men are physically lazy, but nearly all men are mentally lazy. The only way that a man can work without thinking is to do the job the way in which he or someone else has done it before.

A fourth, and possibly the most prolific, source of inefficiency is the belief held by many workmen, and unfortunately taught by many union officials, that in doing efficient work men are displacing other workmen and lowering wages.

A fifth source of inefficiency chargeable to workmen is a feeling of enmity against their employers. A great many workmen are unable to see the community of interest between the workman and the employer. Some workmen act as if they believed that the two

were at war, and that anything done to injure the employer was a benefit to labor. Until all feeling of enmity between capital and labor is replaced by a knowledge of mutual need and appreciation of mutual interest and a desire for mutual success, not only efficiency but also prosperity must suffer.

Those sources of inefficiency which arise out of the imperfections of our political and industrial system are just as important as are those due to faults of management or of workmen. Unlike the latter, however, it is impossible for either the management or the workmen to correct the faults we are about to consider.[1]

See also p. 164. The Fears of Labor and of Capital.

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5. PHYSICAL CONDITIONS OF WORK AND ACCIDENT PREVENTION[2]

[It was said in the statement introductory to this section that one condition precedent to good output is good physical location and good physical plant and equipment, both from the point of view of mechanical processes and from the point of view of their relationship to the workers. We shall in our discussion assume, as self-evident without argument, the validity of this statement as far as technology is concerned. An interesting phase of the relationship of the technological processes to the worker is shown in this reading on accident prevention and in the following one on prevention of occupational diseases. Every reader will realize that both of these selections apply also to that condition precedent to good output which we have called "good human machines, both physically and mentally."]

The physical environment of employes is a determining factor of health, happiness and efficiency. Good ventilation, lighting and sanitary conditions contribute directly to the employe's physical well-being and the ease with which he can work. Fire protection and accident prevention make his labor power more secure. Attractive surroundings afford relief from the strain of monotonous

[1] This part of the discussion is omitted. It deals with the wastes and inefficiencies, the risks and uncertainties connected with our industrial society.—EDITOR.

[2] Adapted by permission from L. K. Frankel and Alexander Fleisher, *The Human Factor in Industry*, pp. 135–40. (The Macmillan Company, 1920.)

or fast work. To this end a button factory in Rochester, New York, provides phonograph music intermittently throughout its various departments. In the machine shops where noise prohibits music, potted plants are arranged in convenient places between the machines. Window boxes, vines, trees, and shrubs decorate the exterior of many factory buildings, which are designed as artistically as private suburban homes. Efforts to beautify the industrial environment of the employe are, it is true, of less importance than the endeavor to prevent accidents, occupational disease and fire, and to provide adequate ventilation, lighting, and sanitation. Nevertheless, since the employe spends at least one third of his day in the workshop, it is desirable that his surroundings should not only make for efficiency, but stimulate his aesthetic and creative faculties.

Growth of accident prevention movement.—No phase of labor maintenance has grown so rapidly as the movement to prevent industrial accidents. In 1906 the first exhibit of safety appliances in this country was held under the auspices of the New York Institute for Social Service. This led to the organization of the American Museum of Safety (1907). In 1912 a small group of engineers met in Milwaukee and launched the National Safety Council, which has taken the lead in the war against accidents. In four years' time it included 15,400 representatives from 3,293 firms, covering 4,500,000 workmen.

There are a number of reasons for this remarkable interest. Not until recently have United States statistics of accidents in industry and their sequelæ been available. These have formed the basis of active propaganda and legislative action. Notwithstanding this, it is estimated that 35,000 workmen are still killed annually—one every 12 minutes—and probably 400,000 receive injuries sufficiently serious to cause them to lose time from their work. In Pennsylvania alone in 1916 industrial accidents caused lost time equivalent to 3,025,371 working days and $7,535,059 in wages.

This loss was formerly borne entirely by the injured workman, occasionally assisted by fellow-workers and the employer. Workmen's compensation laws enacted in most of the States have divided the loss by charging a percentage to the employer. These laws have not only transferred the cost of accidents from employe to employer, but by requiring systematic reporting of accidents have furnished necessary data as to their extent and seriousness. These in turn have led to the safety campaigns.

Possibility of preventing accidents.—Experience has shown that at least 50 per cent of the industrial accidents are preventable. Twenty-two of the foremost industrial concerns of the United States report an average reduction of 54 per cent in yearly accidents after the introduction of organized safety work. The International Harvester Company, the Neenah Paper Company, the Illinois Steel Company, and the Milwaukee Coke and Gas Company each reported a reduction of more than 80 per cent. In eighteen months the Port Huron Engine and Thresher Company, in a plant employing between three and four hundred people, reduced accidents 56 per cent and cut down compensation costs.

Safety devices.—To accomplish these results many ingenious safety devices have been developed to protect workmen. Glass hoods catch the fine steel splinters from the emery wheel; goggles cover the metal grinder's eyes; "congress shoes" with steel plated toes protect the molder from a scalding should he spill the hot metal he is carrying; "safety nets" catch the falling workmen, tools, or materials in construction work; automatically locking doors protect elevator shafts in office building and factory, etc.

Importance of personal equation in the reduction of accidents.—Mechanical appliances play an essential but comparatively small part in accident prevention. By far the larger number of accidents is dependent on the person or persons involved. This has been demonstrated repeatedly by studies of causes of accidents and of methods of preventing them. The experience of the Illinois Steel Company, one of the pioneer companies in safety work, has led them to evaluate the different methods of attacking the accident problem. Only $17\frac{1}{2}$ per cent of the total reduction in accidents is attributed to the introduction of mechanical appliances, and another 8 per cent to improved lighting and cleanliness. Educating by means of lectures, or bulletins, or instruction while at work, was held accountable for 30 per cent of the reduction and the organization of Safety Committees for 20 per cent. This experience is typical.

6. PREVENTION OF OCCUPATIONAL DISEASE[1]

Prevalence of industrial health hazards.—Nowhere has there been sufficient appreciation of the extent and variety of occupational disease. Dr. Hayhurst, after an extensive study, states that "from

[1] Taken by permission from L. K. Frankel and Alexander Fleisher, *The Human Factor in Industry*, pp. 142–44. (The Macmillan Company, 1920.)

one fourth to one third of the medical afflictions of trades persons are due in the whole or in great part, to industrial health hazards."

Processes grouped according to hazards.—In his study of Ohio industries Dr. Hayhurst classifies the hazardous industries as:

(1) Those using poisons as a chief hazard.

(2) Dusty industries.

(3) Those in which fatigue and inactivity are the chief hazards.

(4) Those in which heat, cold, moisture, or dampness predominate.

(5) Those in which there is more than usual liability to contracting communicable diseases.

(6) Industries having miscellaneous hazards not included above.

The largest class is probably the dusty industries. It has been estimated that approximately 5,600,000, or 17 per cent of American wage earners of both sexes, work under conditions more or less injurious to health because of atmospheric impurities caused by dust, fumes, or gases. Professor Winslow has listed some 54 trades in which fine particles of bone, hair, metal, and mineral vegetable materials form a dust which it is more or less dangerous to breathe. This by no means covers all the industries, processes, and occupations which give rise to dust; almost every manufacturing process may expose workers to this hazard unless precautions are taken.

Preventative measures.—A large amount of the unnecessary sicknesses and premature deaths may be prevented with comparatively little effort or cost on the part of the employer. Many occupational diseases may be prevented by:

(1) Securing the scientific ventilation of workrooms, especially by the installation of efficient local exhausts which remove dust at points of generation. In some industries, such as in smelting and refining, fountain-pen-point manufacturing, jewelry, etc., the dust created is valuable, and it has been found profitable to recover the valuable material from the collected dust by means of a patented electrical precipitation process.

(2) Securing cleanliness by providing ample washing or bathing facilities. Some plants provide separate lockers for street clothing and working clothing, so arranged that the worker must remove his working clothes, hang them up to dry or place them in the lockers, and must then pass through the shower room before he can get to his locker containing street clothing.

(3) Wearing of proper protective clothing, viz., respirators and goggles in dusty processes which cannot be taken care of by exhaust

ventilation, as in sand-blasting and emery-wheel grinding; boots and gloves in wet and chemical processes; special shoes for foundry workers; helmets for welders; water-cooled furnace doors for hot-process workers; overalls, aprons, caps, etc.

(4) Shortening the working hours (and, therefore, the period of exposure), allowing rest or "spell" periods in fatiguing and exhausting work.

(5) Requiring physical examinations at entrance, to weed out those unfit for work and to place others where they are best suited physically; and periodically to ascertain whether workers are suffering from the effects of their occupations so that changes may be made and treatment or necessary advice given.

(6) Providing medical care, including first aid and necessary subsequent treatment.

(7) Giving health instruction and safety education.

(8) Proper layout of plant and good housekeeping so that workers in one process are not unnecessarily exposed to the hazards of another adjacent process.

(9) Sanitation of plant to prevent the spreading of communicable diseases. This includes adequate and proper toilet facilities, sanitary bubbling fountains, individual towels, spittoons, etc.

7. THE MAINTENANCE OF PHYSICAL FITNESS[1]

Various ways are now known by which fatigue can be reduced without decreasing the output and even in some cases with an increase of it. When fatigue is caused by work inside factories, it is obviously controlled more easily than when caused by the conditions of living of the workers outside.

Introducing recess periods.—One of the common methods of reducing fatigue is by introducing recess or resting periods during a working spell. During such periods, which, in order to be effective, must be obligatory and not discretionary on the part of the workers, they should have an opportunity to rest, relax, move about, and engage in other simple recreation. A little food or a cup of tea or cocoa taken at such a time is often remarkably restorative. A very striking instance of the benefits of resting periods has recently been published. "Two officers at the front recently, for a friendly wager, competed in making equal lengths of a certain trench, each with an

[1] Taken from Reprint 482, *United States Public Health Service*, pp. 5–11. (Government Printing Office, 1918.)

equal squad of men. One let his men work as they pleased, but as hard as possible. The other divided his men into three sets to work in rotation, each set digging their hardest for five minutes and resting for ten, till their spell of labor came again. The latter team won easily."

Introducing variety into work.—Much of the modern industrial work consists of a constant and rapid repetition of the same movement. A woman worker in one of our munition factories was recently observed to handle during her day's work 24,000 pieces of a shell fuse and put them through a special process. From seven o'clock in the morning until twelve and from one until six she sat at her machine and fed it with the succession of brass pieces. The occasional introduction of a little variety into her work by training her to some alternative process might easily have diminished her fatigue without diminishing the number of finished pieces.

Adjusting the speed.—The capacities of different workers vary greatly. In order to secure uniformity in the work of a squad, where a single motor operates a number of machines, the speed of the motor must be adjusted to the average pace. It may be advantageous to transfer to another job an especially fast or slow person. It is of the utmost importance that each member of the squad should be able to work with the same rhythm and that the speed of operation should be adjusted to this rhythm. Fatigue is least when the speed is in consonance with the worker's customary rhythm, and the output may be twice as great as with a speed a little slower or even faster than this. The worker's speed, however, depends not merely on the adjustment of mechanical appliances, but is also often increased by a well-planned system of incentives, which may consist of piece rates or bonuses, or the making of the work itself more interesting and attractive.

Omitting unnecessary motions.—The pieces which the worker has to handle should be so placed with reference to height and distance from his hands that he is obliged to make no awkward, unrhythmical, and unnecessary motions or excessive muscular exertions in handling them. His work can thus be done with the least possible waste of energy and time.

Providing adjustable seats.—Where workers are obliged to sit instead of stand at their work, the seats should not be of uniform heights, but should be adjusted to the individual worker, with backs of such shape and position as best to fit and support the worker's

back. Where the worker's feet cannot reach the floor, foot rests should be provided.

Ventilation of workrooms.—The ventilation of workrooms is an important aid to efficiency and should conform to the principles of ventilation now accepted. The recent investigation of ventilation has demonstrated that excessive heat and humidity should be avoided so far as possible and that air should be kept in motion. When the worker is in a hot room, and especially when heat and humidity are combined, his bodily temperature rises, often several degrees, and he is put into a feverish state. While movement of the air will not cool the air, it will cool the skin and hence will keep down the bodily temperature to the healthful level. If possible, windows should be wide open; but where this is not possible and wherever even with open windows the heat of the workrooms rises above 68°, forced drafts or electric fans should be used to keep the air in motion. It is astonishing how easily a comfortable and refreshing bodily condition may be maintained by the use of electric fans. Air currents should not, however, be too strong. Bodily discomfort is caused by excessive drafts, and a gentle movement of air is the most effective. Uniformity in the play of air on the skin is undesirable; an oscillating electric fan or a frequent change in the rate of the forced drafts gives the best results.

Sanitary conditions within factories.—As accessory but none the less important means by which fatigue may be lessened and the efficiency of workers increased, there may be mentioned certain general sanitary conditions within factories:

1. Adequate lighting, with the light properly distributed and yet sufficiently concentrated on the work in hand to prevent eye strain.

2. An exhaust system to remove deleterious fumes and dust.

3. Abundant drinking water, cool but not ice cold, within easy reach of the worker.

4. Attractive, quiet rest rooms, especially for women, in which in times of need tired workers may find relief.

5. Lunchrooms or canteens, where a hot lunch of nourishing food, selected according to a scientific dietary and well cooked, may be purchased at cost prices and eaten amid attractive surroundings free from the influence of the saloon.

6. Clean, well-ventilated modern toilets.

7. Washing facilities, with abundant soap and clean towels, and especially shower baths, where the hot, sweaty, begrimed worker may become cool and clean before leaving the plant.

Alternating day and night work.—The industrial urgencies of the war have caused many factories to run both day and night, and have thus increased greatly the total amount of night work performed. Man is not naturally a nocturnal animal, and under our present social arrangements night work must always be regarded as inadvisable on physiological grounds. Lack of sleep produces fatigue. The day sleep of night workers is likely to be curtailed, and in the long run night work is likely to be detrimental to health. This is probably more true of women than of men. Where night work is unavoidable, fatigue can to some extent be avoided by allowing the workers to alternate at intervals between day and night, the periods to be not less than one month in duration. Frequent changes of habits may be deleterious to health.

Adjusting hours of work.—A very obvious way to reduce fatigue is by adjusting the number of daily hours of labor. The British Health of Munition Workers Committee has found that it is a mistake to recommend a uniform day for all kinds of work, that the most profitable duration of the working period varies considerably with the nature of the occupation, and that women and boys, even when engaged in moderate and light types of work, are unable to stand as long hours as men.

The exact relationship between length of day and quantity of output is not yet fully investigated for all conditions, but the great preponderance of evidence favors a reasonably short working day, even in the interests of the industries themselves.

Avoiding overtime.—Arguments that favor the short working day apply directly to the question of overtime. If the usual day's work is such as just to stop short of undue fatigue, overtime means overwork. It is, of course, sometimes necessary, in order to complete a contract within a required time, to call on the workers to expend the greater effort required. It is, however, a dangerous expedient and a particularly insidious way of diminishing a worker's efficiency. Overtime work is apt to result in an increased amount of spoiled work and in lessened output and increased absences on subsequent days, and because of this and also in view of the increased rate of wages that must usually be paid, overtime is not as profitable as is often supposed. It should be resorted to only in times of exceptional emergency, and even then not for many days in succession.

Omitting Sunday work.—The same principle holds for the duration of weekly labor. It is generally acknowledged by those who have studied the question most carefully that all workers should have

one day's rest in seven. At the beginning of the war the amount of Sunday work in the industries of the world was greatly increased. After little more than a year the British Health of Munition Workers Committee reported as follows:

. . . . The evidence before the committee has led them strongly to hold that if the maximum output is to be secured and maintained for any length of time, a weekly period of rest must be allowed. Except for quite short periods, continuous work, in their view, is a profound mistake and does not pay—output is not increased. On economic and social grounds alike, this weekly period of rest is best provided on Sunday.

Sanitary conditions outside factories.—Fatigue resulting from the work inside the plant will appear sooner and be a more serious hindrance to output if the worker is not in a sound condition of body and mind when he comes to his task. Anything which an employer can do outside the plant to promote bodily health and vigor and mental contentment is in the long run profitable. It aids in securing a higher class of workers, greater loyalty to the company, a lessened labor turnover, greater skill, and greater general efficiency. Modern housing, attractive home surroundings, opportunities for healthful recreation, club facilities—whatever will keep workers away from the saloons and other places deleterious to health—are all safeguards against industrial fatigue.

See also p. 196. How Industrial Fatigue May Be Detected.

8. PHYSICAL EXAMINATION OF WORKERS[1]

We are, of course, well aware of the specific reasons for the introduction of the physical examination of workers in this country. The enactment of legislation for the compensation of workmen for injuries has rendered such examination advisable for the purpose of determining the physical condition of workmen upon entering employment, so that unjust claims for accidental injuries might be avoided, and the hazard to fellow-employees, arising from physical defects in workers, reduced.

[1] Taken from Reprint 234 from the *Public Health Reports* (November 20, 1914). By J. W. Schereschewsky, surgeon, United States Public Health Service. (Government Printing Office, 1914.)

Begun on this basis, we are rapidly coming to the realization of the great value of such medical supervision in a larger sense. As a general proposition such medical supervision should have for its objects the following points:

1. *The control of communicable diseases.*—It would seem a matter of simple justice that the worker should be protected from exposure to infection from co-workers suffering from communicable diseases. [Patrons also should be protected.]

2. *The detection of incipient defects and diseases.*—Many individuals have their efficiency much impaired because they are suffering from some easily correctible defect, the existence of which was unsuspected by them. Others are suffering from diseases, such as pulmonary tuberculosis, in an incipient condition which, if neglected, would make such advances as to preclude subsequent recovery. Medical supervision creates an opportunity for detecting such defects and diseases before the damage wrought is irreparable and of advising the worker of the steps which should be taken for their improvement or correction.

3. *Adaptation of the work to the physical condition of the worker.*—It is evident that some classes of work require certain physical qualifications or the absence of certain physical defects or diseases. It is obvious that persons suffering from hernia should not work at occupations which require the lifting of heavy objects, persons suffering from nephritis should not engage in occupations involving great fluctuations in temperature or exposure to cold and dampness, nor should persons suffering from cardiac disease be placed in situations where physical exertion is required, or where a sudden vertigo may endanger the individual or his co-workers.

4. *Advice to the worker.*—The great opportunity which medical supervision affords to advise workers concerning their physical condition is an advantage which cannot be overestimated. The helpful interest thus displayed on the part of the employer toward the physical condition of workers awakens that spirit of co-operation on their part which is necessary to the maintenance of "safe" industrial conditions. Such, at least, has been the experience of plants in which medical supervision has been put in operation.

5. *Record of the physical condition.*—For proper medical supervision it is essential that careful records of the physical condition of workers be kept. In the first place, a record of the physical examination serves, on the one hand, to safeguard against unjust claims

for compensation in the case of injuries, while, on the other, a record of physical fitness will help to substantiate just claims for such injuries. In the second, such records constitute most valuable data for studying the average physique and the condition of the health of workers in any industry.

6. *Education of the workers.*—We are familiar with the excellent work already accomplished in the prevention of accidents by means of the education of workers. A similar campaign in teaching them how to keep well should have like effects in reducing the number of cases of illness.

7. *The prevention of occupational diseases.*—Systematic medical supervision is a most excellent agent to prevent the occurrence of occupational diseases among workers. When such diseases are found in a plant, the first cases will be detected by the medical supervision, so that the sanitary defects responsible for them may be readily corrected. The supervision would serve also as a constant check upon the efficiency of the methods introduced to prevent the occurrence of occupational diseases.

It is evident from the foregoing that the scheme of medical supervision contemplated in this paper is extensive and would entail considerable expense to put in operation. The question which inevitably arises is, "Will it pay?" The answer must be unhesitatingly in the affirmative. The experience of all plants in which such systems have been put in operation is so satisfactory that no doubt has arisen in the minds of their officers that medical supervision does pay in increased efficiency of the working force, greater content of the workers, greater co-operation between employers and employed, and in greatly diminished loss of time and suffering from preventable disease.

See also p. 195. Strength Tests in Industry.

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9. SELECTION AND PLACEMENT[1]

The ability and knowledge to select competently come only after considerable preliminary work has been gone through. They involve—

(*a*) Information in advance as to vacancies: This is one of the worst features of modern conditions. Workmen must be educated

[1] Taken by permission from N. D. Hubbell, "The Organization and Scope of the Employment Department" in *Bulletin 227* (U.S. Department of Labor, 1917).

to give sufficient notice of leaving and foremen must notify the employment department immediately when such notice is given, thus allowing as much time as possible for securing people to fill the positions. This education of the workman involves, in addition to making him realize the fairness of it—(1) a system for paying off in full, when they leave, those who give sufficient notice; (2) having an understanding that leaving without notice must be counted against his record should he ever want a reference from the company; (3) checking up a previous record of employment to see if he has quit without notice; and (4) it also involves, on the part of the employer, giving notice when letting a man out, except in case of discharge for insubordination, malicious conduct, and the like.

(*b*) A thorough knowledge of what material is available: This includes, in addition to applications on the shelf, a knowledge of conditions of the labor market in the locality, and any strikes, lay-offs, and other conditions affecting it.

(*c*) A close personal contact with foremen: This is part of the missionary work. It is simply getting around the shop as often as time permits and keeping in touch with the foremen regarding their wants and what is available.

(*d*) A general working knowledge of all operations performed: From personal observation and talks with the foremen a general knowledge of the work can be acquired.

(*e*) Standard specifications for all classes of help used: Standard specifications would be an outgrowth of contact with the foreman and would involve a knowledge of the operations and the corresponding kinds of help preferred. These should be reduced to writing and approved by the foreman and employment manager.

(*f*) Knowledge of rates and earnings: It is necessary for the employment manager to have a thorough knowledge of rates paid for all classes of work done. This should include day rates and a general knowledge of average earnings on piecework in the plant and as much of this information as can be gained pertaining to other plants in the locality.

(*g*) Investigation of applicant's record: Proper co-operation on the part of employment managers on the matter of references will enable them to weed out many of the undesirables. It is largely a matter of the employment department having sufficient data to give an intelligent and comprehensive record of the man.

(*h*) Physical examination of applicants: Many of the larger and more progressive concerns are now insisting upon a physical examination of new employees before starting work. In many cases it is the outcome of rigid accident compensation laws, but from the purely business standpoint doctors' examinations are a good proposition. They are so common now that very few applicants object to them. A comprehensive employment department is not complete without them.

(*i*) Character analysis: Opinions of employment men vary as to the value of scientific selection and character analysis, but there is without doubt something in the science which would be of value to most employment men. It is for each to use as much of the science as his experience justifies.

(*j*) Testing out applicant for certain work: Many concerns are finding it advantageous in some cases to take the applicant to the department and give him a superficial try-out. This is of special value in the case of operators for special and automatic machines where a minute or two at the machine will prove whether or not the applicant is familiar with it. However, this should be discouraged rather than encouraged.

This will also include taking the applicant into the factory to see working conditions in certain special cases.

Introduce new employees.—At the present time there is not enough attention paid to introducing new employees into the organization properly. If an applicant has been accepted it is worth while to start at once to make him feel at home. The impressions gained during the first few days stay with him and a little personal interest at the start helps him over the critical period. Some one from the employment office should take him to his department when he starts, and the introduction should include:

(*a*) Introduction to foreman and fellow employees: If he is not already acquainted with the foreman he should be introduced to him and arrangements should be made for him to be made acquainted with fellow employees.

(*b*) Explain rules and policies of the company: The most satisfactory way of explaining rules and policies is to give the new man a brief, concise booklet, and supplement it with a verbal emphasis on important points. This gives him an opportunity to study them over at leisure, and not rely on memory to carry all the details.

(*c*) Explain location and use of hospital: The new employee should be shown the location of the factory medical department and

impressed with the necessity of going at once to the hospital in case of any injury, no matter how slight.

(*d*) Point out physical surroundings: General layout of buildings, offices, stock and tool rooms, lunch room, exits, etc., should be pointed out.

(*e*) Point out location of conveniences: This should include wash room, lockers or coat rooms, and toilets to be used in the department to which he is assigned.

Follow up performance of employees.—By taking up this function the employment manager is taking up employment work in the broader sense. This phase of the work is, nevertheless, important, because by following up the performance of all employees, especially new ones, attention is called to "deadwood," round pegs in square holes, and real live material within the organization. It also acts as a check on the judgment of the man doing the hiring and he should benefit by the experience. This follow up should cover—

(*a*) General conduct.
(*b*) Average earnings.
(*c*) Lateness and accidents.
(*d*) Health and accidents.
(*e*) Efficiency rating or periodic certifications by foreman covering at least—
1. Workmanship.
2. Reliability.
3. Willingness.
4. Attitude.
5. Industry.

See also p. 197. Job Analysis.
p. 144. Physical Examination of Workers.
p. 209. Army Intelligence Tests and Trade Tests.

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10. EDUCATION AND TRAINING

A[1]

Among the tendencies that merit special attention is that of establishing schools throughout the country to maintain direct contact with the actual workers in their places of employment. An example of this kind is furnished by the part-time and evening classes in the Southern textile industry. The Bradford-Durfee Textile

[1] Taken by permission from *The Industrial Information Service* (September 30, 1920).

School at Fall River, Mass., which is rearranging its quarters and increasing its staff to accommodate 600 boys, represents the same tendency. Since the passage of the Smith-Hughes Act, which gives federal aid to industrial education on a part-time basis and otherwise, the whole movement has received a distinct impetus.

But employers have not waited for public assistance to promote the training of their employees. They have gone at the job individually through the establishment of apprentice systems and the like: the school maintained by the General Electric Company is a case in point. Or they have acted collectively, for instance through the National Association of Corporation Schools which has recently announced an enlargement of its activities.

The war greatly quickened the movement. The experience with vestibule schools demonstrated in many establishments the economy of systematic training for new employees. Practically every branch of industry has multiplied training departments; from shipyards, mills, factories and mercantile establishments comes the same story of educational effort. In the retail field alone there are three schools whose object is to train teachers for educational work.

Here and there private industry is actively promoting education of an advanced character. Thus the Goodyear Tire and Rubber Company has founded a university, housed in an expensive building and conducted by a teaching staff of 200 instructors. Another example is the technical institute of the Ford Motor Company, to which students from all over the country will be admitted.

Another phase of the movement is the increasing endeavor to provide adequate training for foremen—the technical and "humane" education of these key men in industry. In the same breath may be mentioned the courses for industrial nurses and physicians offered at some of the colleges and universities, and the many opportunities, both public and private, for instruction to potential and actual employment managers and higher executives. Indeed, the training of higher executives may be said to have become a new department in teaching.

Public school departments in several states are more and more linking up their work with industrial needs. Finally there is the establishment by labor unions of colleges and schools designed to help those of their members who feel the lack of secondary and university training. In all these efforts lies the hope not alone of greater efficiency but of a spirit of understanding and co-operation.

B[1]

Methods of training.—As has already been pointed out, training has to go on somehow in practically all shops. It always has gone on—in some form it always will. At different times and in different concerns training has been carried on in a great many different ways, but all of these ways, or methods of securing training, can be put into one of two classes, which we can for convenience call training by absorption and training by intention.

Training by absorption.—Where this method is used there are no definite arrangements made for training. New men "pick up" their work as they can. They get what information they can from others who are on the same sort of jobs. Perhaps they find a "good fellow" at the next machine and "get next" to him at the noon hour. "They use their eyes and their mouths." In this way they gradually get so that they can do some sort of a job or else get fired. If they are able to stay on the job they are finally *absorbed* into the working force—hence the name.

A common modification of this method is where a shop allows piece workers to take on learners as "helpers." As an example, suppose a weaver in a cotton mill is running a certain number of looms, say, for illustration, eight. His wife's cousin makes a deal with him to come in as a "helper." Perhaps the "helper" pays for the privilege. With the aid of this "helper" the weaver can run, say, ten looms instead of the eight, so he makes more money. After a while the "helper" thinks that he can run a few looms himself, and when the mill is short on weavers he gets a chance to try it on his own hook. In this way he gradually becomes some sort of a weaver. What training he got, good or bad, he did not get through any training plan operated by the mill. "*Officially*" the mill had nothing to do with it. It did not even know "officially" that the man was in training.

Another illustration of how this method works in practice is when a man "steals his trade." For example, he goes to a machine shop where they work on a lathe job. In a few hours or half a day the foreman finds out that the man knows nothing about his job and fires him. However, he has found out something about the job. He goes to another concern, represents himself as a lathe hand and gets a job on the strength of it. This time he may last a few days.

[1] Taken by permission from C. R. Allen, *The Instructor, the Man, and the Job*, pp. 11–16. (J. B. Lippincott Company, 1919.)

He works the same game again with another shop. Because he knows a little more he may last a little longer. By keeping this game up he may finally become able to do some sort of a lathe job.

As in the other cases, what he got he got by himself, with what help he could get from other men whom he "pumped" as he could, and who were not supposed to help him, but were supposed to work on their own jobs.

Training by intention.—This method differs from training by absorption in that there is some recognized plan for training new men. Somebody is expected to train them either as all of his job or as a part of his job. Some illustrations of how training by "intention" is carried out in practice would be an apprenticeship scheme; a definite recognition of helpers as a part of the working force; a definite responsibility placed upon foremen to train new men as well as to get out production. Definite training departments, whose sole responsibility is to train, and trade schools, would illustrate training by intention carried to the extreme point of development. In all of these cases somebody is paid to train the new man. It is *intended* that he shall be trained—hence the name.

Some ways by which intentional training is carried out in practice.—Of course intentional training is carried out in all sorts of ways in practice, and the methods of "breaking-in help" that are usually followed in such schemes for intentional training are well known to shop men, but for purposes of discussion some of the more common methods are given here.

(1) The foreman, in addition to his responsibility for getting out the product, is made responsible for the training of new men. He personally instructs them, keeps track of them, checks them up. Many foremen have been very successful in training men themselves and, in some cases, have developed most excellent methods.

(2) A competent workman (an "old hand") is put in charge of one or more learners (helpers, apprentices, green men). In the old days, under the apprenticeship method, this was the standard plan. Training is, of course, carried on in the regular shop as in the first case.

(3) Certain men are given the exclusive job of training. These men are paid to do nothing else. Men are broken in by them—it is their job and nobody else is supposed to have anything to do with the man until he is trained. Such men are sometimes called *instruct-*

ing foremen to distinguish their job from that of production foremen. Under this plan training is also carried on in the shop.

(4) Training is not carried on in the regular shop but in special "training shops," so that men do not get into the regular work until they have been thoroughly trained. Under good conditions the training is given with the same equipment as that of the production shops, and the same sort of work is carried on. A modification of this plan is the trade school shop as it has been developed in some parts of the country.

(5) Distinct training departments are established with distinct heads and instructing staffs. So long as men are in training they are under the authority of the training department and not under the production foremen. When properly trained in the training department they are turned over to the production department as competent men. Training may be given in special shops or in the regular production shops.

Of course, there are many modifications of these five forms. For example, a foreman will often start a distinct training shop for elementary training. This separate training shop may be in some corner of the production shop. After a little preliminary breaking-in in the special "shop," the man's training will be completed in the regular shop. The five examples given will, however, serve as a basis for discussion.

C. Personnel Administration in Terms of Incentive and Output: the Will to Do

In this section, the emphasis is upon incentives, upon the development of the will to do. In giving this emphasis, it would be simple, and as futile as simple, to make lists of the various kinds of incentives available for modern industry—financial, non-financial, direct, indirect, present, deferred, and all the rest of them—and then make corresponding lists of the technical devices, which could be utilized in calling these incentives into operation. With the technique we are not greatly concerned in such a rapid survey as the one in which we are engaged. We seek to get a sense of perspective concerning the use of technique rather than skill in its manipulations.

It will aid in getting this perspective to see the stages through which "incentive and output" have passed in the history of Western industrialism. For convenience in discussion let us speak of three

stages: first, *the stage of simple industry*, beginning in the medieval period and extending to the time of the industrial revolution, that is to say, to the latter part of the eighteenth century; second, the *transitional stage*, comprising the first hundred years or first phase of the industrial revolution; and third, the *current stage*, covering the last generation or two of our history which is sometimes called the second phase of the Industrial Revolution.

Our earlier picture of the stage of simple industry, where two or three apprentices worked for the master and where an established procedure, drawn on the basis of time spent and achievement, provided for promotion from apprentice to journeyman and from journeyman to master, provides a setting for an appreciation of the application of incentives in that simple society.

It was easy and natural for the worker of that time to develop a pride in workmanship—easy for him to gratify his "creative instinct." He owned and cared for the tools with which he worked and had an owning craftsman's pride in those tools. He owned the product, or at the very least had intimate personal relationships with the owner, and there was accordingly both pride of ownership and a direct visible connection between the amount of output and the amount of reward. He worked through various stages of production in an intimate way so that he saw his work actually developing under his hands and could feel that he was expressing his personality through his product. The product was typically disposed of to friends and acquaintances so that reputation and standing in the community attached to his workmanship. He saw an almost automatic method of rising to the direction of industry so that hope and expectation and realization were closely connected, if indeed they were not one. His position in society was certain and readily understood. And finally custom's firm grip upon his mind kept him free from soul-torturing questionings concerning his status. The picture had its darker side as well. Mental horizons were narrow; mental furniture was meager and bare. The brighter side is here presented not to portray a state to which we could tolerate return, but to give us a comparative basis for the study of present-day incentives.

What we have called the transitional stage (running, say, from 1750 to 1860 or 1880) began with the Industrial Revolution, a term that connotes modern specialized, impersonal, large-scale, technological industry. For generations prior to the opening of this transitional stage the market had been widening, the demand for out-

put had been growing. Partly as a result of this enlarging market there came forth the power-driven machine and a tremendous increase of productive capacity. But this increased productive capacity did not sate the market. Oddly enough the market expanded still more rapidly, so rapidly indeed that it outran production. In part, this was due to the influence of machine industry itself, as expressed in the steamship, the railroad, and later the telegraph and the telephone in enlarging the area of the market. In part, it was due to the fact that this transitional period marked the opening up of great stretches of the world to the use of man—South America, Africa, Australia, and our own Middle West, the greatest consuming market the world has ever known. In part it was due to the most rapid increase of population the world has known, a population, too, with an ever-rising standard of consumption.

For all these reasons the transitional period (1750–1880) is marked by an ever-increasing hunger for output, *for output at almost any cost*, and, as always, our industrial structure was adjusted to the situation. It so happened that the deliberate and conscious part of that adjustment was worked out largely on the technological side as contrasted with the personnel side of industry. The reasons for this are easy to see. The results of an improvement in processing were visible and tangible and the manager could measure the gain at once in dollars, whereas attention to personnel meant results far less tangible and measurable. Moreover, the sciences basic to improvement in technology had had considerable development, whereas the social sciences basic to personnel work are of a later time. Again, except for the period culminating in the ephemeral organizations of 1835 and 1836, labor was docile and not inclined to force attention to the terms and conditions attached to its contribution to productivity. It is not surprising therefore that in this transitional period the hunger for output led to the development of schools of technology, such as schools of engineering, mining, agriculture, and to the establishment of the so-called private business colleges concerned with the clerical techniques of administration such as bookkeeping, penmanship and stenography, rather than to the study of intelligent handling of personnel.

But this does not mean that industrial and social forces affecting personnel had been inoperative. Without management being aware of it, tremendous changes had occurred, changes whose consequences were to be felt most seriously in the later period. In general terms,

through default of real attention to the problem, wage had been allowed to become the chief, almost the sole, incentive for the worker. Pride in workmanship and ability to gratify the creative instinct had waned. No longer owning the instruments of work, he no longer had a craftsman's pride in them, and shortsighted management provided no substitutes. No longer owning the product, he no longer had a pride of ownership and except for the piece work (and we know how the piece worker fared in rate cutting) the connection between output and reward was not close. Working now mainly in detailed specialized operations and no longer working with simple tools, he could not see the work developing under his hands and could not feel that he was expressing his personality through his product. No longer disposing of his product in a personal way to a local group, his community standing became that of an impersonal factory hand. No longer in a simple society where his status was largely fixed by custom and where he saw without reflection his contribution to social weal, his pride of responsible position was weakened, and neither management nor society saw the wisdom of restoring it. Of all the incentives of the earlier period, wage and wage alone grew in importance, and it is, speaking accurately, a technical device rather than an incentive.

And, unfortunately (unfortunately because the experience gives a false sense of accomplishment and security to many present-day managers) wage, as the prime incentive, seemed to secure satisfactory results. This was only in the seeming. The truth is that the mental attitudes of masses of people changed but slowly under the conditions of that time. The traditions of simple industry still ruled. Men still had pride in work. There still clung to men's minds the individualistic theory of abundant opportunity to rise, a theory nourished by the existence of the frontier and by rapidly expanding industry. Furthermore, although the grip of custom on men's minds had been loosened, its place had been taken by a natural-rights or natural-order philosophy which induced an optimistic outlook upon the workings of competitive industrialism. The transitional period was one of increased output, not because wage was an entirely satisfactory incentive, but because the loss of conditions which provided other incentives had not been fully realized. Social attitudes had not kept pace with rapidly changing industry.

And now we come to the current phase of the history of output and incentive—the period of the last two generations. Gradually

the relationship between productive capacity and the absorbing capacity of the market shifted. Partly because of the great productive gains flowing from improved technology in an industrial régime in which incentive, though greatly changed, had not yet materially weakened; partly because of a checking of the rate of increase of population; partly because the new regions of the world were becoming fairly well exploited, the rate of increase of productive capacity began to outrun the rate of increase of the market. The time is not difficult to locate historically. It was heralded by a series of events. Since markets must be eagerly searched for, the "orthodox" system of distribution—manufacturers to wholesaler to retailer to consumer —which was so satisfactory when the market was seeking the producer, had its hold challenged by devices aimed at enabling the producer to strengthen his grip upon the consumer, and the "commercial revolution," with its mail-order houses, its national advertising, its chain stores, and its direct selling, is now upon us. The trust movement, aimed partly at economies of production but primarily at control of distribution, came into being. The scientific management movement sought lower costs of production through increased and better application of technology to industry, through increased specialization in management, through better location of individual responsibility and through better methods of wage payment (notice the implication that all was not well with the wage incentive). Nations drifted into imperialism and finally into war in the struggle for markets.

In this hurly-burly of changing industrial conditions one thing stands out clearly for our purposes. The tightening of markets did not mean that the producer could reduce his output. On the contrary, because of large-scale production and the presence of enormous overhead costs, he sought means of increasing his output, but it was now imperative that this output should be *at decreased cost.*

The developments in the field of incentives paralleling this new attention to output have been striking. As much as forty years ago there had clearly emerged, for those who cared to see, a strong suspicion, shared by both workers and management, that all was not well with wage as a sole incentive. Towne and Taylor, who sensed many things ahead of their time, saw the situation. It is no accident that one of Taylor's early contributions concerned itself with methods of wage payment and that he *sought*, at least, a wage which was "psychologically correct." Others in the management group saw it also, but

few so clearly. In a bewildered, trial-and-error way they tinkered with other devices—with profit sharing, with welfare work, with this and that miscellaneous practice—and their tinkering was a confession of the inadequacy of the wage incentive acting alone or largely alone. The "will to do" that meant increased output at lowered cost of production was not present among the workers.

And this might have been expected. The spectacular events, for example, the trust movement and the passing of the frontier, which marked the coming in of our current stage of industrialism sank into the minds of the workers as a warning that the day of automatic and easy rise to responsible positions had really passed. There came to them a realization of what the forces of the Industrial Revolution had, unguided, wrought. And they were not minded to acquiesce, for belief in a beneficent "natural order" of things had yielded, thanks to the influence of Darwin, to an evolutionary philosophy which demanded improvement and it yielded the more readily because many happenings had, as we have seen, engendered distrust, suspicion, and fear. In default of intelligent action by either management or society, the workers turned naturally and properly to a device of their own with which they had long experimented—the union. That their earlier, and indeed their present, demands were formulated in terms of the gain spirit which seemed to them the characteristic thing in industry, that they sought and still do seek more wages, and more and more, deceives no one who watches other than surface indications. Wage alone will not bring contentment in such an impersonal specialized society as ours. Wage alone cannot bring men to work together effectively. It, unaided, will not remove sourness, suspicion, and hostility. Powerful as it is, valuable as it is when wisely used, it must be linked with forces making for pride of workmanship, interest in work, knowledge of worth-whileness to society, security of economic and social position, and sense of responsibility, before we shall unlock those vast resources of human energy which now lie dormant because we have not given thought to the fashioning of keys which will free "the will to do."

Let us not deceive ourselves concerning the significance of this "will to do." It involves no mere unthinking performance of "an honest day's work," whatever that may mean. It implies the calling forth of those latent powers which emerge in the joy of doing, and doing understandingly—in the joy of intelligent service. The magnitude of those latent powers we cannot even guess, though hints

have been given each of us in our own experiences, and the sense of waste is appalling when we reflect that such powers grow by utilization. Perhaps, both inside and outside the factory, we are not now realizing on one-quarter of the human resources which would be called into being if men worked together understandingly with a real "will to do"—perhaps not one-tenth, perhaps not one-twentieth. Who knows? We merely know that the waste is enormous.

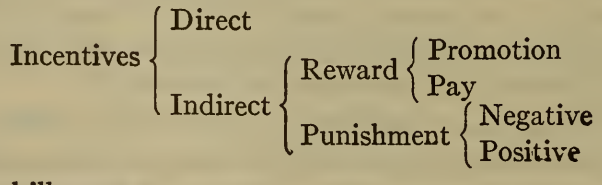
Let us not deceive ourselves, either, concerning the difficulties involved in calling forth this will to do. Generations of sour distrust must be lived down and that cannot happen until the sources of distrust have been removed. Even after the sources of distrust have been removed, there must yet come *understanding*, and this involves both knowledge and appreciation of the place of industry and of specialists in social progress. Not only are the difficulties great, but co-operation in solving them will come grudgingly. The prevailing attitude of hard-headed management is doubtful, if not frankly antagonistic, toward such an enterprise. The prevailing indifference of society at large (witness the lack, in our elementary and secondary-school systems, of studies leading to an understanding of our social relationships) bodes ill for effective co-operation by society, notwithstanding the present hectic interest in "Americanization." The prevailing attitude of the worker, one of indifference tempered with distrust and hostility, means much cultivation before even seeds can be sown. Nevertheless, the game is worth the candle. Even if he can make but a few halting steps toward the ultimate goal, the personnel manager must keep it before him. Men must be brought to work together effectively, and full effectiveness can come only with the will to do. Administration of incentives must be in terms of that outstanding fact.

PROBLEMS

1. "In other words, restricted effort in production arises from fears respecting the contribution each of the parties makes, or concerning the share which each of the parties takes. Both are based in the fear that rewards will not be adequate or proportionate to the effort put forth." How can these fears be minimized or eliminated?
2. "Frequently a greater output is the result of, or involves, changes and readjustments which are positively painful and disadvantageous to the workman directly concerned." Cite such a case. Is there anything the manager can do about it? Has the worker no redress?

3. The following are listed by one writer as causes of distrust and suspicion:
   1. Dissociation of workers from industrial management and responsibility.
   2. Mutual ignorance of each other's points of view.
   3. The suspicion of profiteering by the management and of unjust demands for increased wages on the part of the laborers.
   4. Fear of unemployment and its consequences.
   5. Reluctance of some employers to recognize trade unionism and to organize themselves in federations.

   Suggest concrete ways in which these causes can be eliminated or minimized. Are you certain that output would be increased by the removal of the fear of unemployment?
4. What effect has the transfer of thought, skill, and intelligence from the worker to the machine and to management had upon the security of the worker's position? Upon incentive?
5. The insecurity of labor has been ascribed to one or more of the following: (*a*) the machine system; (*b*) production on a large scale; (*c*) pecuniary competition; (*d*) the sensitiveness of modern industry; (*e*) the scheme of prices; (*f*) the rhythm of the business cycle; (*g*) the rapid development of technique; (*h*) dependence upon distant and future markets; (*i*) specialization; (*j*) weaker position in the bargaining relation. Are these points well taken? What bearing do they have on incentive?
6. "It will be observed that the elimination of fear has been at the root of all regulation Industry has thus far undergone." Consider the governmental regulations you know of and cite the fears each was designed to remove.
7. Some people think one of the great difficulties in connection with labor problems is that the incentives which labor had in former days have been taken away by the consequences of the Industrial Revolution. Make out a list of the incentives labor had in the days of medieval industry in England. What ones of these have been taken away by the Industrial Revolution? Have any new incentives sprung up to take the place of the old ones? Is the wage the only incentive today?
8. Gilbreth outlines his treatment of incentives as follows:



   Explain and illustrate.

9. "But it is not unlikely that we shall find, upon candid examination that even under self-direction there is still much machine work which offers no outlet for creative energy." What can be done about this work?
10. The modern great automatic factory has probably more chances for interesting work for more people than ever did the medieval and romantic small shop." Do you think so? If so, can these chances be utilized?
11. "Yet it would be foolish to suggest any one panacea for uninteresting work. How to make work interesting is just as much a field of experiment and investigation as how to invent a machine or lay out a plant. And business men, engineers and educators can be just as ingenious and successful doing it." Have any plans been worked out? If so what are some of them?
12. "As a rule, men habitually use only a small part of the powers which they actually possess and which they might use under appropriate conditions." What are appropriate conditions? Can they be created in the modern factory? If so, how? If not, why not?
13. "In fact the current industrial unrest is due in great part to the enormous accumulation of suppression which the instincts of workers have undergone in the grim effort to get a living." Discuss.
14. "In remuneration of employees, no hard and fast rules of universal application exist and moreover a system that would produce excellent results under one man might prove wholly unsuccessful under another." Could several systems of payment be used in one shop?
15. In what cases is day work desirable? In what cases piecework?
16. "The contract system exists where foremen in charge of work are given a certain price for the work to be done. They hire and direct the men, usually paying them on a day basis." What are the advantages? The disadvantages?
17. How can the day wage be administered so as to promote efficiency?
18. "As the influences of aggregation and specialization began to make themselves felt and as personal relations vanished, the day-work method became less and less applicable." Explain.
19. What are the advantages of the ordinary piece-rate system to employer and worker? Its disadvantages? How do you account for the fact that piece-rate wages have nearly always been attended by rate-cutting?
20. "After all, one argument in favor of the piece rate is decisive. When pay is so much per piece it is a matter of indifference to the manager how long the laborer takes to finish the piece. Supervision may thus be largely dispensed with and of course this means a saving." Is this true?
21. "Task setting furnishes a good example of the interdependence of business problems. The task for an individual workman cannot wisely be

set until routing, scheduling, and standardization, etc., has occurred." Explain. Can you put content into the "etc."? What is meant by task setting?

22. "The Taylor plan establishes by study a standard time. The worker gets a high piece rate when the standard is attained and a low piece rate when it is not attained." What is presupposed in the Taylor plan? What are its advantages? Its disadvantages?

23. "Henry R. Towne adopted this scheme. He found out average labor cost per unit in the best year before introducing his scheme. If now a saving occurs in this cost the saving is distributed at the end of the year or at the end of some considerable time as follows: 50 per cent to the firm, 10 per cent to foremen, 40 per cent to gang bosses and workmen on the basis of the annual wages." What are the advantages? The disadvantages?

24. "Under the Gantt plan the worker receives only a day rate in case he does not accomplish the task set. The task is set on the basis of a scientific investigation. If the worker accomplishes the task he gets his day rate plus a bonus in the form of an extra time allowance, usually from 25 to 50 per cent of the time allowed for the task." What are its advantages? Its disadvantages?

25. "Like the Halsey and Gantt systems, Emerson assures the workman his day wage. Like Taylor and Gantt he sets a standard performance based on careful study. For the attainment of the standard a large bonus is offered as in the Gantt method, but smaller bonuses may be earned before reaching this standard. In the practical operation of the method by Mr. Emerson the bonus is calculated monthly and not for individual jobs." What are the advantages of the Emerson plan? The disadvantages?

26. "Rewards under scientific management are (*a*) positive, (*b*) predetermined, (*c*) personal, (*d*) fixed, (*e*) assured, (*f*) prompt." What is the significance of each statement?

27. "The accurate measurement of effort does not in itself either raise or depress wages." Is this equivalent to saying that it has no bearing on wage determination?

28. "Some of the wage systems are merely modes of payment. Others are philosophies of management." Explain.

29. A manager started a new department. He could not fix wages at the market rate of that vicinity for there was none. He began by setting the wage in accord with the neighborhood cost of living and the standard of the men he would take on for the new work. What would you have done?

30. "I have solved the labor problem so far as my own factory is concerned. I pay my men a rate of wages somewhat higher than they can get elsewhere. For them I have provided recreation facilities,

sanitary conditions of employment, etc. Every employer will solve the labor problem if he does as I have done." If all employers should follow this employer's example, would the problem be solved?

31. Why do unions attempt to establish the principle of uniformity with respect to wage rates, hours of work, and conditions of employment generally in a trade?
32. "A wage system that will stimulate output is desirable in that it reduces unit labor costs. However, a wage system that will stimulate output is desirable even though it does not materially reduce the unit labor cost." Explain.
33. "There may be cases where it is wise policy to stimulate production by an increase of wages more than proportionate to the increase in output." What cases?
34. If the worker produces three times more output under scientific management than he does under the traditional plan, why does he not get three times as much wages?
35. Can an individual firm safely enter into an iron-clad agreement with its men never to cut a piece rate? Can it safely refrain from such an agreement?
36. "A thoroughly effective method of remuneration includes both principles, (1) the differential incentive, which acts on the individual as such; and (2) profit-sharing, which acts on him in his collective capacity, as a member of a body bound together by common interests and working for a common end." Is this the solution? Is it always possible?
37. As a stimulus to production, under what circumstances would profit-sharing be of most value? Of least value?
38. "On the side of the employees we find several reasons, the most compelling of which is the unalterable hostility of the trade unions to any form of profit sharing or labor co-partnership." Do you see any good reason for this hostility? Are not these plans of benefit to labor?
39. What are the prerequisites to the successful operation of a policy of promotion in accordance with merit?
40. Define "voice in management."
41. Suppose that you should become convinced that, everything considered and in the long run, it would be profitable financially and worth while socially for labor to "be taken into partnership" with capital in a spirit of "industrial democracy." (*a*) What do these terms mean to you? (*b*) How could such a thing be wise financially? (*c*) What obstacles are in the way of its attainment?
42. "The inequity of labor exercising an important voice in the direction of industry (to which, of course, it is entitled) without at the same time accepting responsibilities for the service rendered by industry to society is obvious. Here as elsewhere the rule must apply that power and responsibility should be co-ordinate." How can he be made to assume responsibility?

43. "The shop committee has been installed and may be installed by employers as a mere subterfuge, designed to ward off a real shop organization by controlling the election of its committees, by mixing unorganized with organized workers, by preventing the employment of trade unionists." Is this possible? What do you think of such a policy?
44. "The blighting character of industry is due to its motivation, which is wealth exploitation and not wealth creation." Do you agree? What can we do about it?
45. It is fairly easy to see why and how the employer is interested in increased incentive. Is the worker interested? Is society?
46. "The workman needs to know more about the actual problems of management. He needs to know something about overhead, about marketing difficulties, about the dependence of production and production conditions upon marketing, and the dependence of marketing upon economical production, about the numberless hazards and chances of loss which his employer must face. He needs, in short, more of the manager's point of view." Can the manager give him this point of view? If so, how? If not, how can the worker get it?

11. THE FEARS OF LABOR AND OF CAPITAL[1]

In the processes of Industry, the unwillingness of individual parties to put forth their utmost effort may arise from defects of character, inadequacy of training, or lack of opportunity. Where opportunity, training, and capacity are present, failure to realize the best in effort arises mostly from the fear that one or other of the parties will put forth a less than proportionate share of effort, or claim a more than proportionate share of reward.

The fears which circumscribe the freedom of effort of Capital, Management, and the Community are by no means so real or considerable as those which surround Labor. They differ, also, in that they represent consequences much less serious to human life. Especially is this true of fears concerning employment. Under conditions in Industry which make the several parts of industrial processes dependent on many others, and which demand intense specialization of effort, it is impossible to exaggerate the imminence of fear in the lives of workers wholly dependent upon continuous employment for the immediate necessaries of life.

Capital can wait for its reward. Capital, moreover, is free to move about. If not required in a particular locality or business, it readily finds investment in some other place or enterprise. Labor

[1] Adapted by permission from W. L. M. King, *Industry and Humanity*, pp. 234–43. (Houghton Mifflin Company, 1918.)

is not so mobile. It is confined in a thousand and one ways. It is necessarily largely restricted to occupations to which it has been trained. It is more or less rooted to localities which speak of home and its associations. It is largely ignorant of the world without. Capital is a citizen of the world, with no definite occupation or home. It suffers little from fears of isolated position, substitution, dismissal, arbitrary and unjust treatment. Such risks as it runs are very largely its own. How vastly different is life to its possessor under such circumstances!

It is the fear of unemployment which lies at the root of most of the minor fears which Labor entertains. The fear of unemployment is in reality the fear on the part of Labor that capital will not be provided to carry on industry continuously, and under conditions which will afford adequate remuneration to effort. It is an outgrowth of the fallacy that quantity of work is necessarily limited. This fear gives rise to the fear that the introduction of new machinery, or the increased use of machinery already installed, will displace labor; the fear that speeding-up processes will diminish work; the fear that female, child, unskilled, or imported labor will be substituted for skilled; the fear that men of one trade will encroach upon the work for which men of other trades have been specially trained; the fear that the number of apprentices will be so increased as to lessen the requirement for skilled hands; and the fear that long hours and continuous overtime will exhaust employment.

Allied to the fear of unemployment is a class of fears which, as seen, have a special bearing on industrial peace: the fear of discharge and of unfair treatment through the utter helplessness of the isolated workman in relation to the capitalist employer, and, still more, in relation to a powerful corporation; the fear of lockouts or arbitrary exactions, and the many fears incident to tyrannical and capricious behavior on the part of those in authority, and especially of subordinate officials toward workers under their direction. This fear extends to the power of wealth to defeat the ends of justice, by corrupting officials and influencing or controlling the judiciary and legislatures, and to the influence also of a class interest and sentiment on the part of the monied classes as distinguished from the working classes. With it are allied the many fears which have a special bearing on health in Industry: fears, for example, of physical injury and ill-health, and of inadequacy of compensation or redress when injury is done.

Arising from the worker's sense of utter helplessness is also the fear, apart from combination, of the absence of any voice in determining the contract on which services are given, and the fear, in consequence, of unfair terms in bargaining and in determining the rate of remuneration, the hours of labor, and working conditions. This extends to the fear of reductions in standards already gained; the fear of individual or general reductions in wages, of increase in hours, of change in customary practices; the fear of resistance on the part of employers to combination; and the fear of methods intended to destroy or weaken organization. Whatever begets fear of opposition to organization helps to intensify other fears.

Beset by fears at once so numerous and constant, it must be apparent that Labor is in no way capable of putting forth effort to the utmost of its capacity. Where the mind is in a state of unrest, the arm is divested of some of its power, and the hand of some of its skill. Time which otherwise might be freely employed in furthering production, with benefit in opportunity and reward to all the parties to Industry, is consumed in effecting organization against ills that are feared, or in agitation concerning their existence.

Whilst less serious in their immediate personal consequences than the fears which Labor endures at the instance of Capital, the fears which Capital experiences at the instance of Labor are by no means inconsiderable or unreal. What these fears are is well known; they have received heightened emphasis under the stress of war. The source of all is the fear that Labor will not be provided in quantity and quality sufficient to carry on Industry continuously, and under conditions which will afford adequate remuneration to investment. Foremost is the fear of strikes, and their consequences. If Labor refuses to work, Capital and Management likewise become idle, unless transferred to other industries. Transfer, however, is not always possible. Capital invested in Industry is partly "fixed" in plant and equipment; and markets, as well as Labor, have to be found for the output of new enterprises. Management, too, becomes identified with particular classes of business, and new openings are not always at hand.

The fear of strikes would be minimized were actual or threatened resort to strikes postponed until other available means of securing redress were exhausted. Unfortunately, strikes are sometimes brought on where no grievances whatever exist. The cause of the

so-called "sympathetic strike" may lie wholly beyond the control of the trade or industry affected. Because of uncertainty on so many grounds, the possibility of strikes has become an ever-present fear.

Allied to the fear of strikes is the fear of labor combination, and its attempts to control the labor market, and to restrict output. This fear has greatly increased with the augmentation of Labor's power consequent upon extensive organization and the growth of class consciousness. The obnoxious restrictions are all in the nature of limitations upon the freedom of initiative and power of direction, usually of the employer, but sometimes also of the workman. Briefly classified, restrictions of the kind include such practices as hampering the installation of the best machinery, or the speed at which it is worked; preventing the introduction of new processes; limiting the freedom to engage, or to promote, or to put at any kind of work, any workman, irrespective of training, age, or sex. Among such restrictions are also to be included the limitation in numbers of apprentices; the insistence on trade unionism and employment of union labor to the exclusion of any other; the demarcation of employment; the requirement of a minimum wage; the objection to systems of remuneration by piece work or bonus systems; and restrictions in hours of work, and the prohibition of overtime.

Analogous to the class of fears begotten of labor control and restricted output, are the fears that "discipline," as it is termed, will be interfered with; that employers will not be free to dispense with the services of undesirable, incompetent, or unnecessary workmen without risking a cessation of work; and that disputes cannot be adjusted except in accordance with methods prescribed by organizations to which workmen belong.

The fear that Labor can be secured, so to speak, only on its own terms, which may involve exorbitant demands as respects hours, wages, and working conditions, is supplemented by the fear that even where a contract is entered into, with precise stipulations, its provisions may not be lived up to. There is the fear also that one concession may be used to force another, and that arbitrary exactions of many kinds may be attempted.

Finally, there is the class of fears associated with extreme measures, with revolutionary movements, and with violence, as, for example, the boycott, sabotage, revolutionary socialism, revolutionary syndicalism, the I.W.W.'s, and all forms of anarchy.

12. THE GULF BETWEEN LABOR AND CAPITAL[1]

It is frequently stated that the necessity for establishing industrial relations today is the growth of the factory system wherein all personal contact is lost between owner or manager and the worker. While this is true, it does not sum up the entire loss. In the system of absentee directorate there are other evils as well, and these taken together have set up situations where there have been clashes over the rights, needs, and aspirations of those who belong to the class of employers and those who form the great group of employees. These losses in fitness for control may be stated in this wise:

a) The loss of personal contact and relationship that formerly existed between the master and his skilled workmen and apprentices.

b) The loss due to the lack of personal knowledge of the work being done on the part of present-day directors and managers.

c) The loss due to the lack of personal knowledge of the tools and equipment used in production of the part of present-day managers.

d) The loss of the direct oversight of saving and conserving materials and human effort on the part of present-day managers.

e) The withdrawal from productive work of the families of the directors and managers.

f) The loss of equality of living conditions between the families of the directors and managers and the workers.

The effect of these losses in creating a situation where there may be a clash of interests, and failure on each side to understand and appreciate the other, is brought home when we contrast the human relationships in the days of craftsmanship with those of the factory system.

See also p. 543. Some Consequences of Technological Industry.

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13. THE INSTINCTS AND MOTIVATION[2]

The importance to me of the description of the innate tendencies or instincts to be here given lies in their relation to my main explanation of economic behavior, which is:

1. That these instinct tendencies are persistent, are far less warped or modified by the environment than we believe; that they

[1] Taken by permission from L. P. Alford, "Status of Industrial Relations," *American Society of Mechanical Engineers*, No. 1693 (1919) pp. 166–67.

[2] Adapted by permission from C. H. Parker, "Motives in Economic Life," *American Economic Review*, VIII (1918), 212–31.

function quite as they have for a hundred thousand years; that they, as motives in their various normal or perverted habit form, can at times dominate singly the entire behavior and act as if they were a clear character dominant.

2. That if the environment through any of the conventional instruments of repression—such as extreme religious orthodoxy, economic inferiority, imprisonment—or physical disfigurement—such as short stature or a crippled body—repress the full psychological expression in the field of the instinct tendencies, then a psychic revolt, a slipping into abnormal mental functioning, takes place, with the usual result that society accuses this revolutionist of being either wilfully inefficient, alcoholic, a syndicalist, supersensitive, an agnostic, or insane.

The following catalogue of instincts includes those motives to conduct which, under observation, are found to be unlearned, are universal in the species, and which must be used to explain the innumerable similarities in behavior, detached in space and time from each other. [Only the catalogue has been retained. The original has much excellent explanatory material.]

1. *Instinct of gregariousness.*
2. *Instinct of parental bent: motherly behavior: kindliness.*
3. *Instinct of curiosity: manipulation: workmanship.*
4. *Instinct of acquisition: collecting: ownership.*
5. *Instinct of fear and flight.*
6. *Instinct of mental activity: thought.*
7. *The housing or settling instinct.*
8. *Instinct of migration: homing.*
9. *Instinct of hunting.*
10. *Instinct of anger: pugnacity.*
11. *Instinct of revolt at confinement: at being limited in liberty of action and choice.*
12. *Instinct of revulsion.*
13. *Instinct of leadership and mastery.*
14. *Instinct of subordination: submission.*
15. *Instinct of display: vanity: ostentation.*
16. *Instinct of sex.*

The instincts and their emotions, coupled with the obedient body, lay down in scientific and exact description the motives which must and will determine human conduct. If a physical environment sets itself against the expression of these instinct motives, the human

organism is fully and efficiently prepared for a tenacious and destructive revolt against this environment; and if the antagonism persists, the organism is ready to destroy itself and disappear as a species if it fails of a psychical mutation which would make the perverted order endurable.

Even if the labor-class children evade those repressive deportment traditions that characterize the life of the middle-class young, at a later date in the life of these working-class members certain powerful forces in their environment, though they work on the less susceptible and less plastic natures of mature individuals, produce obsessions and thwartings which function at times, exclusively almost, in determining the behavior of great classes of the industrial population. The powerful forces of the working-class environment which thwart and balk instinct expression are suggested in the phrases "monotonous work," "dirty work," "simplified work," "mechanical work," the "servile place of labor," "insecure tenure of the job," "hire and fire," "winter unemployment," "the ever-found union of the poor district with the crime district," and the "restricted district of prostitution," the "open shop," the "labor turnover," "poverty," the "bread lines," the "scrap heap," "destitution." If we postulate some sixteen instinct unit characters which are present under the laborer's blouse and insistently demand the same gratification that is, with painful care, planned for the college student, in just what kind of perverted compensations must a laborer indulge to make endurable his existence? A western hobo tries in a more or less frenzied way to compensate for a general all-embracing thwarting of his nature by a wonderful concentration of sublimation activities on the wander instinct. The monotony, indignity, dirt, and sexual apologies of, for instance, the unskilled worker's life bring their definite fixations, their definite irrational, inferiority obsessions.

The balked laborer here follows one of the two described lines of conduct: (1) he either weakens, becomes inefficient, drifts away, loses interest in the quality of his work, drinks, deserts his family; or (2) he indulges in a true type inferiority compensation, and in order to dignify himself, to eliminate for himself his inferiority in his own eyes, he strikes or brings on a strike; he commits violence, or he stays on the job and injures machinery, or mutilates the materials. He is fit food for dynamite conspiracies. He is ready to make sabotage a part of his regular habit scheme. His condition is one of mental stress and unfocused psychic unrest, and could in all

accuracy be called a definite industrial psychosis. He is neither willful nor responsible; he is suffering from a stereotyped mental disease.

14. THE RELEASE OF HUMAN ENERGY[1]

A large fund of human energy is usually latent, a fact shown when people engage in sports. Even the lazy youth, so called, will surprise his elders by the head of steam developed when a fishing trip is under consideration; and if spading for angleworms could be appropriated for purposes of tilling the garden, a family supply of vegetables would be a universal luxury. The tale is told of a designing person who suggested to a group of boys that a ditch was on fire and that the stones in a nearby pile were buckets of water. The boys put out the "fire," incidentally moving the stone heap, with great enjoyment and actual refreshment. In the world at large here and there are individuals who work in the spirit of play; they do much with far less fatigue than was experienced by the negro who sat on the plow handles "hurrying up sundown." But in a multitude of situations today the spirit of joyful accomplishment is absent. Freight cars are slammed together—they belong to "the company." The plumber is deliberate. Workmen loiter and the comings and goings of the boss are noted with an interest which does not appear in putting in window casings. The ticket agent who "damns" the railroad upon opening his envelope, containing in fact a slight advance in wages, reveals a state of mind. The spiritless and sodden tread of millions headed for factories cannot but be impressive. Enthusiasm is guarded against by system, lest the employee produce more than the rules of his fellows allow; and this is not to criticize a method of warfare, for warfare it is. How many are joyful over the day's work? How often is the clock not stared out of countenance? What of the inner strain and depression of employees in factories when they "look upon their employer as an aristocrat, their foreman as a slave driver, their machine as a treadmill, and the world at large as against them," and when "their faces are frozen in a perpetual grouch?"

The forced production represented by slave-labor and the difficulty of getting people to work with spirit suggest that there has been historically and is today an almost complete neglect of the

[1] Adapted by permission from A. D. Weeks, "The Mind of the Citizen," in *American Journal of Sociology*, XXI (1916), 642–48.

organization of industry with reference to natural incentives. People cannot be kept from working, provided employment corresponds to nervous organization. Need there be so complete a divorce between spontaneity, preference, and play, and the job? Must work be drudgery? Cannot the distinction between work and play be greatly lessened if not abolished? Nothing is more unsuited to human nature than the steady grind imposed by the division of labor and the factory system, which tend to make man a machine. Especially odious is the antithesis of routine and initiative and of physical and mental activities represented by the workroom and the office; one performs, the other manages; one is hands, the other head. In splitting up work we split up people. One has to be trimmed down to fit into a niche.

It might seem difficult to introduce into a system of production a distinct recognition of the individual tendencies related to travel, experimentation, curiosity, sociability, sympathy, hunting, leadership, and the like, but only by more fully conforming to natural interests may the time-honored curse of drudging labor be transformed into joyful effort.

There should be proper and sufficient motivation in industry. To work because one fears to lose a position is a low condition, and the dread of the displeasure of the boss reduces one to the status of dumb driven cattle. Even to spend a lifetime in labor for the sake of anticipating funeral expenses does not strike one as adequate motivation. There must be sizable returns or explicit approval; there must be the feeling that one is getting somewhere, that he is getting something out of his work for himself, and that every stroke tells for an objective point. To exhort one to love his work when he gets nothing out of it is unseemly. Our systemless compensation leaves the great bulk of population without effective incentive.

It is a question of much importance whether real pleasure is taken in work. The actual mental attitudes prevailing among people working for wages and salaries are, if among the more elusive, yet among the most important conditions of society. If there is chronic discord between the man and his job, something is fundamentally wrong. Even in cases where irritation does not take the shape of open complaint, a seated sense of injustice deeply influences happiness on earth. Young men set out in high hopes, to become soured and careless upon being inoculated with the suspicion that a square deal in the economic system is out of the question. They see great

rewards going to questionable beneficiaries; they see the industrious exploited; they come to fear that everything worth going after has been gobbled up by the representatives of privilege and corporate influence. They ask if it is worth while to try to get ahead; they believe the cards are stacked against them. The rewards which society should place before the individual should in one respect be like the penalties for crime—they should be certain.

The loosened moral fiber of great numbers, the flabby attack on difficulties, the disposition to go with the current, and the apparent passing away of a certain Spartan quality of perseverance are associated with a growing skepticism in regard to certainty of reward.

See also p. 663. Antagonism of Specialists Increases Risk.

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15. WAGE INCENTIVE: FORMS OF PAYMENT[1]

Broadly speaking, there are two possible bases of payment within the wage-system—payment for time worked and payment for output. There are indeed all kinds of modifications and minglings of these two principles; but they are none the less fundamentally distinct. A worker may be paid in strict accordance with the time spent on the employer's work at so much per hour, per day, per week, per month, or per year; or he or she may be paid in accordance with the work done at so much per piece, or per unit of effort. Again, the method of payment may be either individual or collective: the employer may deal separately with, and pay wages by time or output to, every worker individually, or a lump sum may be paid over to a single worker on behalf of a group, or to the group itself.

These two systems are, I have said, in principle distinct, however they may mingle in practice. But, to a very great extent, they do possess a common basis. A time-work system is never wholly without relation to output; for the employer inevitably expects a certain amount of work from the worker whom he employs, and if this amount is not forthcoming, he finds his remedy in discharging the worker. Payment by output, again, is never wholly without relation to a time standard; for piece-prices are invariably determined to a great extent by the income which constitutes the normal standard of life for the workmen concerned.

[1] Adapted by permission from G. D. H. Cole, *The Payment of Wages*, pp. 1–19. (Labour Publishing Company, 1918.)

This common basis of time payment and payment by output, however, does not remove their essential difference. Under a pure time-work system the employer no doubt expects and exacts a minimum standard of output; but the worker who produces less than this, as long as he continues to be employed, and the worker who produces more, both receive the same remuneration as the worker who produces exactly the minimum demanded. On a system of payment by output, on the other hand, the reference to a standard weekly wage may determine the general level of remuneration (*e.g.*, the piece-work prices, bonuses, etc.); but the actual remuneration of the individual worker will vary with his or her output from day to day, or from week to week. Payment by time means equal payment to all workers who are classified together by the employer or by trade union regulation; payment by output means unequal remuneration for members of the same grade.

We have seen that time-work has, in practically all cases, some reference to output, in that the employer can and does dismiss a man who is not doing what he regards as a fair, or an average, day's work. This principle, however, is very elastically applied, and under an ordinary time-work system it is seldom possible to say exactly what is the minimum amount of work required by the employer. Where the minimum becomes fixed, time-work passes over into task-work. The task-work system, in its complete form, is a system under which the worker is set a definite output which must be attained per day, or per week, or per month. If the fixed output is not attained, a proportionate deduction is made from the wages paid to the worker; if it is exceeded, nothing extra is paid. Needless to say, this system is strenuously opposed by the workers, nor does it exist in any organised trade; but many of the features of the task-work system exist in those cases in which a certain output is rigidly exacted, and the worker who fails to reach that output is at once dismissed.

Not a few of the "efficiency" systems which are connected with the name of "Scientific Management" reproduce some of the conditions of task-work in that they penalise by a specially low rate of payment the worker who fails to reach a certain standard of output, and reward the worker who reaches or exceeds this output.

Systems of payment by output are far more various and complicated than time-work systems. In some cases payment by output is the natural and almost inevitable remuneration for certain kinds of service which cannot easily be paid by time: in others it is a con-

scious device for the acceleration of production. In the first case the system tends to be simple; in the second the employer, in a continual search for new stimuli, tends to adopt more and more complicated devices, and very often a job passes through successive stages of time-payment, piece-payment, and bonus or "reward" payment. The principle of ordinary piece-work is essentially simple. Instead of receiving so much per hour, the worker receives so much for every operation, or group of operations, performed, at a flat rate per operation, the wages received being strictly proportionate to output. There are, however, many modifications of this system in practice. Where trade unions are strong, they generally attempt to secure a guarantee that the earnings of the piece-worker will not fall below the hourly rate of wages. Not only do the unions seek to establish piece-prices on such a basis that actual earnings under piece-work conditions shall be above the standard time-rate; they also demand an absolute guarantee that every worker shall receive at least the standard time-rate, without reference to output. In some few cases they have gone further, and have provided that, since piece-work is openly advocated on the ground that it secures greater output and therefore greater effort from the worker, more than the standard time-rate (*e.g.*, time and a quarter) shall be guaranteed to every individual who is working on piece-work.

Naturally, piece-work is most easily adaptable to those occupations in which the work done is "repetition" work, *i.e.*, in which an identical job is repeated an indefinite number of times. This is the position in all manufacturing industries which are highly standardised, and especially in the textile industries. It does not matter in such cases whether the number of distinct jobs is large or small; for provided that they are repetitive in character, a standard price can be fixed for each job. Where the number of jobs is small and their nature simple, piece-work conditions are easily adjusted: when jobs are numerous and complicated, the most elaborate systems are sometimes adopted for the fixing and maintenance of piece-work prices.

So far we have been speaking of piece-work as a uniform system of payment strictly in proportion to output. It now remains to mention some of the variations of this general principle. Cases exist, though they are not frequent, in which, under a straight piece-work system, the piece-price diminishes as output increases, the price per article diminishing after the output has reached a certain

point. On the other hand, in some cases the piece-price increases with increased output, in order that production may be stimulated to the full. This motive, however, more generally expresses itself in the granting of a bonus after output has passed a given point. Thus, at this stage, the piece-work system develops into the bonus system.

Bonuses, as an incentive to output, take several forms. The simplest is that which we have just described, the bonus being merely superimposed upon the piece-work system without any essential change in the method of remuneration. In other cases a bonus of the same type is superimposed upon a time-work system. Only in the premium bonus system and in some American "efficiency" systems does a really distinct form of payment arise. In the various forms of the premium bonus system the basis is no longer a piece-price per article, but a standard time allowance in which the job is supposed to be done. If time is saved by the worker, that is, if the job is done at greater speed and in a time less than the standard allowance, payment is made for a portion of the time saved in addition to the hours actually worked.

There is one other method of remuneration which deserves a mention side by side with those described above. This is profit-sharing in its various forms. We have seen that the employer often desires to adopt a system of payment by results as an incentive to output. This end he may strive to attain in another way by giving his employees an "interest in the business." Instead of affording them a chance of earning time and a quarter or even time and a half on piece-work or the premium bonus system, he may pay them a percentage on wages varying with the profits of the concern. This is, of course, quite different in principle, though those employers who advocate it have the same end in view—and perhaps other ends as well. It is, however, a distinct method of payment, and one which has been, and may yet be, advocated as an alternative to piece-work or the premium bonus system; and the fact that it may be put forward as an alternative entitles it to a place in our consideration.

[The author sums up his discussion of points of view concerning forms of payment as follows.]

We have seen that a system of payment by results is easiest to establish and operate where the following conditions are present:

(1) Where a given amount of effort and skill can be relied upon to result in a given product.
(2) Where the product is easily measurable in simple quantitative terms (*e.g.*, by the ton).
(3) Where increased productivity means a considerable saving in standing charges, and thereby a reduction in the cost of production per unit.
(4) Where a highly developed system of collective bargaining exists, or where such a system can be created.

We have seen further what are the main inducements for the employer to press for payment by results:

(1) The desire for increased output as a means of reducing the cost of production (this is the same as [3] above).
(2) The feeling that individualist justice will be done if each worker is rewarded according to his productive efficiency.
(3) In some cases, the possibility of ascertaining the amount the worker is capable of producing, and then of cutting prices to the lowest possible limit.

Next we saw the worker's reasons for preferring payment by results in certain cases:

(1) The possibility of greater freedom in respect of time-keeping and attention to work.
(2) The chance of higher earnings, and the greater interest given to the work by the monetary inducement.
(3) In some cases, the same individualist feeling as we ascribed to the employers.

We then turned to the arguments on the other side, and first we dealt with these from the employer's point of view:

(1) The possibility of cheapening cost by supervision and drive, and of securing piece-work intensity for time-rates of wages.
(2) In some cases, the feeling that it is immoral for the workman to earn more than his standard rate.
(3) In some cases, the desire to preserve a high quality of workmanship.

Lastly, we saw the working-class objections:

(1) The fear of speeding-up.
(2) The fear of price-cutting following on speeding-up.
(3) The desire to preserve a high standard of craftsmanship.

(4) The fear of unemployment due to a higher productivity per man in an inelastic market.

(5) The fear that payment by results will break up solidarity by setting man against man and breeding mutual jealousy and suspicion.

16. WAGE INCENTIVE: A PHILOSOPHY OF MANAGEMENT[1]

[It has been well said that some wage systems are merely modes of payment while others are aspects or applications of a philosophy of management.

One illustration, the differential piece rate, must suffice for our discussion of this second form of wage system. Frederick W. Taylor, looking at the results of the industrial revolution as they were visible in the eighties, saw evidences of tremendous waste. Rejecting piecemeal solution, he developed a certain system or philosophy of management which is now ordinarily called the Taylor System. Briefly stated, he stood for the following:

1. An increased application of science to industry. Through time study, mainly, he planned to develop a great "code of natural law" which would be binding upon all industry—upon management as truly as upon worker. Preliminary to and concurrent with actual time study, of course, was to come a vast deal of standardization, careful planning, and responsible administration. His application of science to industry was not to be confined to the technological side of industry. He was as much concerned in getting the "right" wage, from the point of view of incentive, as he was in getting correct feeds and speeds.

2. An increased specialization and an increased responsibility for management. Management, primarily, was to be responsible for developing the great code of natural law and for applying the code within the plant.

3. The restoration of individual responsibility which had been too largely lost in a régime of mass production.

Such a view, incomplete as it is, will explain why Taylor's system of wage payment took the form shown in the following reading.]

[1] Adapted by permission from C. B. Going, *Principles of Industrial Engineering*, pp. 133–35. (McGraw-Hill Book Company, Inc. 1911.)

More than thirty years ago, at the Bethlehem Steel Works, Frederick W. Taylor began a development of the conception that labor of all kinds, operations of all kinds, could be scientifically studied and analyzed and reduced to elementary processes; that these elementary processes could be performed in some one best way, discoverable by an expert investigator; that there was a minimum of time in which each could be continuously performed by a good workman; that the workman could be taught to do each elementary operation, and hence the entire job, in the best way and the minimum time; and that the payment of a considerably larger price for work done according to the standard than for work that failed to reach the standard would secure the co-operation of the employee and induce him to put forth his best effort.

Taylor begins by an ultimate analysis of the job into its elements. Each of these elements is then subjected to thorough expert study to determine the methods and appliances by which a man working steadily at a pace he can maintain without injury can reach maximum performance and minimum time. The workman is then provided with everything necessary to accomplish, in the standard time, the results determined by this study, and he is thoroughly instructed in every step of the operation by minutely detailed written schedules and by expert advisers.

Finally, he is paid at piece rates which are set at two different levels—a low price per piece if the workman fails to do the job in the standard time, and a high price per piece if he does it in the standard time. This is the so-called differential rate. The successful worker is paid not only for the more pieces he turns out, but he is also paid more for each piece. The unsuccessful worker not only makes less pieces to be paid for, but is paid less for each piece of the smaller number he makes. The money gain to the man who attains standard performance thus becomes very large.

For example, suppose a standard performance for a certain repetitive job is set at ten pieces completed per day. The piece rate may then be fixed at 30 cents each if standard time is attained and only 25 cents a piece if it is not. The workman who finishes only nine pieces in a day receives but 25 cents each, or a total of $2.25. The workman who finishes the ten pieces as a standard receives 30 cents each or a total of $3. For an increase of only 11 per cent in production he gains an increase of 33 per cent in wages. This large incentive is provided to enlist the co-operation of the workman—to make him

contribute his part to the effort which was begun by the management in their study of conditions and their provision of the equipment and the instruction.

See also p. 588. Measuring and Communicating Aids: Time Study.
p. 844. The Range of Time and Motion Study.

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17. WAGE INCENTIVE: A WAGE FORMULA[1]

[This is an interesting attempt to fix wage rates in terms of all factors bearing upon the economic good of the plant. The particular equation shown was one which is regarded as applicable when the premium method of payment was used. Do not try to master the details; merely notice the range of factors which are taken into account and compare such a method with the ordinary time or piece rate system.]

The equation is

$$r=\left[\left(\frac{K[B\ (1+i+m+ny)+R]\ (1+2e}{V\ (1+1.3E-3.e)\ (1+.35P_a)+S}\right)\left(P_t+P_d\ (1+.5e\right)\right]C$$

and for the determination of labor and indirect cost (not including materials) is:

$$X=[r\ (1+e)\ +R]\ t$$

The definitions of terms follow. They are common in both equations:

r = Base hourly rate man is to receive
K = A constant, when V is 100 per cent, to bring worker under standard conditions to standard rate
B = Fundamental base rate, temporarily that of 1905
i = Percentage of increase in living since 1905, taken on the 15th of January, April, July, and October
m = Percentage allowed for each extra process known or learned
n = Percentage allowed for years of connected service
y = Years of such service
R = Fixed charges rate per hour which man has chance to modify
e = Percentage of premium earned on time allowance
V = 100, which is the standard accomplishment per cent
E = Standard premium task time set

[1] Adapted by permission from G. D. Babcock, "The Taylor System in the Franklin Shops," *Industrial Management*, LII (1917), 534–54.

P_a = Percentage of time absent or late
S = Value of spoiled work per producing hours worked
P_t = Percentage of time under task
P_d = Percentage of time spent on non-task or straight time work
C = Co-operation and conduct
X = Labor and fixed charge cost
t = Time taken to do work

18. WAGE INCENTIVE: WHAT ARE FAIR WAGES?

A[1]

Nowhere in business is blank stupidity so rigidly standardized as in wages. Take some of the controlling dogmas of wage payment: "I pay the market rate of wages; what more can I do?"

The "market rate" is now only a cant phrase in merchandising. There is no market rate in commodities in spite of market quotations. You find prices quoted for the staples such as cotton, wheat, and the like, but when you go to buy for particular uses you discover that by paying more than the quoted rate you will get an especially good quality or brand which will save money in the end by being suited to your exact needs. The best purchasing agents seldom buy goods at the market; they buy that which will give the best service—the largest return for the money without regard to the initial outlay. Price is neither a purchasing nor a sales argument among long-headed business men.

The whole trend of modern business is away from making a product which will merely join the herd of similar products, and is toward making something that will stand out—something that will be different and better than the others. But wage methods have not caught up with merchandising and they will not until the old ideas of master and servant are abandoned and business is considered as a democratic, mutual enterprise.

Another current dogma is that any given product can afford to have only a certain amount of wage included in its cost and that the wage must always be a fixed percentage of the sales price. Hence, if wages go up, so do the sales prices. This dogma is common to

[1] Taken by permission from *Have We Reached the Limit of Wages?* A pamphlet by W. R. Basset, pp. 3–14 (The Knickerbocker Press, 1919). Later appearing in book form under the title *When the Workmen Help You Manage.* (The Century Company.)

both employer and employee; it finds expression in many ways. It does not take into account the service of a man; it holds that his service value is fixed and inviolate and that there is something sacred about pre-war or pre-any other period wages and that we should revert to them with all speed.

The first step in any wage consideration and the first step toward the new idea in business is to get the real values on wages. We all know that cheap labor is not cheap; paid cotton pickers have proven cheaper than slaves—although it took a long time so to convince the South because they never reckoned the expense of idle slaves. In any operation in which the material costs are high as compared with the labor costs, the highest possible pay is the cheapest if it results in savings of material or in a fine product, or in both. In the grades of production where labor is the big factor, high wages are economical if the wastes of human power can be cut to a minimum. Wages are measured solely in terms of production. It is the part of the employer to see that facilities for production are given and then it is his right to demand that they be taken advantage of.

I have taken the employer's usual approach to wages in an effort to show that wages are seldom what they seem to be and that it takes a very thorough and scientific knowledge of a business before one can say that wages are high or low. The fact that they have repeatedly been raised does not mean that they are high, nor that they have been lowered mean that they are low. They are high if they do not return value; they are low, regardless of their total expression in dollars, if they do return value. There is no reason in the world that a common worker should not make $150 a week—if he does that much work. And it is the combined fault of the employer and the employee if he does not do that much work. But the fault of neither is chronic. If both regard a wage increase as something to add cost and not as a step toward cheapening the product, then the raise is wrong. Raising human costs to save eventual costs sounds paradoxical, but that is the trend of scientific industry and marks the passage of the worker from slave to fellow artisan and of the owner from blind to enlightened manufacturing.

It is really almost impossible to survey even the commonest operation without discovering that it is not only costing too much but that no one is benefiting from the increased cost. The workers are not being paid as much as they should earn, the owner is paying too much, and the public is being mulcted in the final cost.

B

Wage is generally regarded as the main motivating device in modern industry, but what do we really know about methods of wage payment? We know that the various methods are worked out in terms of a basic rate, but what is the *right* basic rate—right in terms of calling forth the will to do? Is it the current rate in the community? Suppose the current rate is not sufficient to shelter, clothe, and nourish the worker to the point where he is a good physical machine; will it not pay both society and the manager to lift that current rate to a physical efficiency basis? And what is a physical efficiency basis? When it is attained, may it not pay society and the manager to go beyond it if that calls forth the will to do? What is the current rate of wages, anyhow, but a resultant of social forces, some of which are woefully inefficient, not to say positively harmful? But perhaps the right wage is a function of the manager's costs. What does the average manager know about his costs and especially about the causes and conditions lying back of those costs? Even when he does know, does what he can *now* afford to pay give any conclusive finding with respect to what he ought to pay to call forth the will to do? But perhaps the right wage is a function of a good standard of living. At the best, would this do more than guide to the right minimum wage? And what is a good standard of living? Does it mean a good standard for a single worker, or for a family of three, or of five, or of fifteen? And what does "good standard" mean anyway? We shall do well to admit that we are in the stage of elementary thinking concerning wage payment as a constructive force in industry. Neither our economists, nor our psychologists, nor our uplifters, nor our hard-headed business men have solved the problem. Barely have they stated it.

19. PROFIT SHARING: ITS FORMS[1]

Broadly speaking, the profit-sharing principle divides itself into five major groups:

1. *Profit sharing* in the real sense of the word, with these essential features:
   a) Amount to be distributed varies with and depends upon the net profits of the concern or upon the amount of dividends paid the stockholders.

[1] Taken from Bulletin 208, *U.S. Bureau of Labor Statistics*, and Mallory, Mitchell, and Faust, *Profit Sharing as an Aid to Contented, Efficient Labor.*

b) Proportion of profits for distribution is definitely determined in advance.

c) Benefits of plan extended to at least one-third of the total employed, and including employees in occupations other than executive or clerical.

d) Method of determining individual shares is known, at least in a general way, to the participating employees.

2. *Limited profit sharing*, with these essential features:

a) Same as (*a*) in profit-sharing plan above.

b) Same as (*b*) in profit-sharing plan above.

c) Benefits of the plan limited to less than one-third of the total employed, and excluding employees other than executive or clerical.

3. *Bonus plans*, under which the divisible fund does not depend upon or vary with the net profits of the enterprise, but upon any one of the following factors:

a) Price for which commodity manufactured is disposed of—the so-called sliding-scale wage.

b) Gross receipts or gross profits—a variant of the sliding scale.

c) Estimated probable profits on business.

d) Wages or salaries earned and length of service.

e) Length of service and thrift, as shown by the participant's ownership of stock of the employing company or maintenance of a savings account.

f) Savings of the prospective participants as shown by subscription or ownership of a specified amount of stock of the employing company, or savings accounts.

g) Amount of savings collectively effected in production or operation.

4. *Benefit associations* which are affected by the following factors in distributing their funds:

a) Where the industry concerned contributes materially toward the maintenance of such fund.

b) Where the industry concerned makes a merely nominal contribution toward this fund.

c) Necessities in each individual case.

d) Length of service or period of membership in association.

5. *Pension funds*, with these determining factors:

a) The fund maintained wholly by the company itself.

b) Contributions or assessments made on the employees by the company for aid in maintaining this fund.
c) Amount allowed each year by the company definitely determined upon in advance.
d) Amount set aside to be a percentage of the annual pay-roll.
e) Method of arriving at amounts of pensions awarded each person is governed by:
(1) Length of service.
(2) Wages earned.
(3) Individual necessity.

20. THE THREE-POSITION PLAN OF PROMOTION[1]

[Promotion is, of course, one device which is used in developing incentive. This reading should be regarded as a sample of promotion schemes.]

We wish to emphasize, then, three points: (1) the necessity of attracting desirable applicants; (2) the necessity of holding, fitting, and promoting those already employed; (3) the interdependence of these two.

The three-position plan of promotion considers each man as occupying three positions in the organization, and considers these three positions as constantly changing in an upward spiral, as the man is promoted from the lowest position that he occupies and into the position next higher than the highest position that he occupies. The three positions are as follows: first and lowest, the position that the man has last occupied in the organization; second, the position that the man is occupying at present in the organization; third, and highest, the position that the man will next occupy. In the first position the worker occupies the place of the teacher, this position being at the same time occupied by two other men, that is, by the worker doing the work, who receives little or no instruction in the duties of that position except in an emergency, and by the worker below who is learning the work. In the second position the worker is actually in charge of the work, and is constantly also the teacher of the man next below him, who will next occupy the position. He is also, in emergencies, a learner of duties from the man above him.

[1] Taken by permission from F. B. Gilbreth and L. M. Gilbreth. Reprinted from *The Annals of the American Academy of Political and Social Science*, LXV (1916), 289–96.

In the third position the worker occupies the place of learner, and is being constantly instructed by the man in the duties of the position immediately above.

Naturally a plan like this demands a close co-ordination of all positions. This is provided for through the master promotion chart. This chart is in the hands of the man in charge of promotion. It is slightly different for each organization. It consists of a schematic arrangement of all positions in the organization, so arranged as to provide for lines of most rapid advancement along the various functions and subfunctions under which the measured functional management by which we operate works.

The interests of the individual worker and his education as to importance of promotion are carried on through the individual promotion charts. Upon these the records of each and every member of the organization are separately kept. These sheets are often called "fortune sheets," and it is this aspect of them that is of peculiar interest to the psychologist. When a worker becomes a member of the organization, he is called into the department in charge of advancement or promotion, and given one of these fortune sheets. Upon it is shown his present position, and he and the man in charge outline together his possible and probable line of advancement. The sheet then becomes his fortune map, or fortune schedule. The projected line of promotion is outlined in green, and upon it are placed the dates at which it is hoped he may reach the various stages of advancement. At set times the worker and the promotion chief, or one of his helpers, meet, and the line of actual progress of advancement of the worker is traced upon the map in red, with the dates of achieving the various positions. The two then consult as to existing conditions, the special reading and studying necessary for fitting for the new positions, possible changes or betterments. The direct product of this is that the worker understands what he is doing, gets expert advice for greater progress, and realizes that there is and must be co-operation between him and the promotion department for the good of all concerned.

The by-products are equally, or more, important. One is that the worker is glad to impart all information that would be of help to the organization as to his history and antecedents, his home and other social conditions outside the plant, that help or hinder his plans of preparing, ambitions, etc.

The second by-product of these fortune sheets is directly connected with the solution of the problem of getting constantly a group of desirable applicants from which to select more wisely. Thus, when the worker looks at his fortune sheet and understands the three-position plan of employment, he recognizes that he must train someone to take his position before he can hope to be most rapidly advanced. Naturally he first looks around in the organization to see who is available, for it is always desired that those within the organization be advanced first. However, if no such person is available, he reviews his entire acquaintance and all possible sources for new workers, in order that he may obtain the most desirable person easy to train into that position. It is not necessary to dwell long upon the advantages of this system.

21. EMPLOYEES' REPRESENTATION

A. DEFINITION[1]

1. *The term "employees' representation"* is being used in this reading to include an established arrangement whereby the employees of a business concern are represented by persons recognized by the management as spokesmen for them in conferences on matters of mutual interest. The term "industrial representation" is often used as the equivalent of "employees' representation." Neither of these terms is to be regarded as synonymous with "industrial democracy," which implies a measure of popular control that is not guaranteed in any plan of representation we have investigated.

2. *Forms and names assumed.*—Employees' representation may take the form of "works and shop committees," "joint industrial councils," as established in England under the Whitley plan, "shop stewards' committees," union "business agents," or some combination of these, and under a variety of names. It may exist in non-union, "open shop," "preferential shop," or "closed shop" establishments. The form of organization may embrace simply one concern, a chain of plants under common management, a group of works under separate managements located in a common district, or a number of establishments under separate managements, but representative of one or several allied industries. Examples of all of these forms are to be found in the United States and in England, some of them having been in operation for many years.

[1] Taken by permission from a report of the Independence Bureau.

The simplest and perhaps the most characteristic form of employees' representation in the United States is the "works committee" composed of delegates elected by the workers to represent the various departments, groups of related departments, or, in some cases, crafts. This body usually meets at stated intervals, weekly or monthly, either alone or jointly with an equal, or at least not greater, number of persons representing the management, and exercises a degree of authority, advisory or final, with reference to complaints and suggestions coming from the employees regarding wages, hours, working conditions, welfare, and other matters of special interest.

3. *What employees' representation provides.*—Employees' representation may provide simply an orderly method for the adjustment of grievances; it may include machinery for collective bargaining with reference to wages, hours, and working conditions; it may be the means of eliciting from workers their hearty co-operation and valuable suggestions regarding processes, organization, and policies; or it may involve all of these or any combination of them. Its structural features may be very simple and the procedure altogether informal, or these may be highly elaborate. The power possessed by employees through their industrial representation may be that of "public opinion"—the authority of the representatives being merely advisory to the management—or the management may delegate to the employees final authority in regard to certain specified matters.

B. AN EXTREME CASE[1]

I. In order to safeguard and promote the enduring interests and welfare of both the employees and the management of the X Manufacturing Company, and to enable that company to play more fully and adequately its part as a unit in the economic life of the nation, a Conference Committee of twelve shall be constituted, whose duty it shall be:

A. To determine the principles and policies which should govern industrial relationships in this plant, and

B. To set up machinery or processes for carrying these principles and policies into effect.

Six of the members of this Conference Committee shall be selected by the employees of the plant from among their number by any

[1] Taken from "A Suggested Plan for a Conference Committee on Industrial Relationships" for a certain manufacturing company.

method which these employees in caucus assembled may determine. These six shall designate one of their number as a joint chairman. The other six members of the committee shall be selected by the management of the plant from among the officials or the employees of the company by any method of selection the management may determine. These six shall designate one of their number as a joint chairman.

The Conference Committee shall be selected within two weeks of the time this plan is received by the parties interested, and shall proceed at once to the accomplishment of its task.

II. The Conference Committee shall approach its task with an entirely unrestricted attitude. Solely by way of suggestion and not at all as an indication that all the points mentioned below shall be considered by the committee, or as an indication that the committee's discussion is to be limited to these points, the following are mentioned as matters upon which the committee may well determine principles and policies to guide industrial relationships in the plant and set up machinery for carrying these principles and policies into effect.

A. Matters generally considered to affect primarily the employees, but which actually affect employees, management, and community alike:

1. Methods of fixing, paying, and readjusting wages, whether day rate, piece rate, or other form of compensation.
2. Methods of safeguarding and improving working conditions by such means as better methods of sanitation, provision of safety devices, medical examination and advice, etc.
3. Methods of increasing the economic security of the workmen, such as mutual aid, insurance, savings, investments, longer term wage contract, regularization of employment and production, etc.
4. Relationship of employees to outside organizations.
5. Opportunities for self-expression and initiative on the part of the employees, both inside and outside the plant.

B. Matters generally considered to affect primarily the management, but which actually affect management, employees, and community alike.

1. Employment methods, including classification, advancement, discharge, discipline, absenteeism, labor turnover, etc.

2. Production problems and increase of output, including methods of interesting employees in their work, such as the posting or distribution of information concerning the character and uses of the product, the various phases of production, the achievements of other plants, results of new methods or processes, the relationship of shop organization to labor efficiency, etc.
3. Trade conditions, trade competition, and the reduction of costs, including methods of eliminating waste of materials, better utilization of the practical knowledge and experience of the employees, etc.
4. Relationship of management to outside organizations.
5. Labor supply and labor administration.

C. Matters generally considered to affect both the employees and the management, but which certainly affect the community also, such as:
1. Machinery for the prevention of differences and the settlement of such differences as may arise.
2. Education, adaptation, and training, both in the shop and in the schools.
3. Legislation, both state and national, on matters pertaining to the industry.
4. Lectures, conferences, and research on subjects of general interest to the industry, including readjustment of conditions in industry from war to peace basis.
5. Utilization of inventions and improvements in machinery or methods, securing for each party an equitable share of the benefits.

D. Matters generally considered to affect primarily the community, but which also affect both employees and management, such as:
1. Standards of living and living conditions of the workers, including adequate housing, rental charges, economy in purchasing, education, recreation, etc.
2. The relationship of the plant to the social and economic life of the community.
3. The relationship of the industry to the economic and social life of the state and the nation.
4. The contribution of the plant to the problems of industrial relationship in the industry as a whole and in the nation at large.

C. ANOTHER CASE[1]

Declaration of principles.—We, the members of the National Metal Trades Association, declare the following to be our principles, which shall govern us in our relation with our employees:

Concerning employees.—(1) Since we, as employers, are responsible for the work turned out by our workmen, we must have full discretion to designate the men we consider competent to perform the work and to determine the conditions under which that work shall be prosecuted, the question of competency of the men being determined solely by us. While disavowing any intention to interfere with the proper functions of labor organizations, we will not admit of any interference with the management of our business.

Strikes and lockouts.—(2) This Association disapproves of strikes and lockouts in the settlement of industrial disputes. This Association will not countenance a lockout, unless all reasonable means of adjustment have failed; neither will the members of this Association deal with striking employees as a body.

Relations of employees.—(3) Every workman who elects to work in a shop will be required to work peaceably and harmoniously with all his fellow employees, and to work loyally for the interests of his employer.

Apprentices, etc.—(4) The number of apprentices, helpers, and handymen to be employed will be determined solely by the employer.

Methods and wages.—(5) We will not permit employees to place any restriction on the management, methods, or production of our shops, and will require a fair day's work for a fair day's pay.

Employees will be paid by the hourly rate, by premium system, piece work, or contract, as the employers may elect.

Freedom of employment.—(6) It is the privilege of the employee to leave our employ whenever he sees fit, and it is the privilege of the employer to discharge any workman when he sees fit.

Concerning disagreements.—(7) The above principles being absolutely essential to the successful conduct of our business, we cannot permit the operation of our business thereunder to be interfered with. In case of disagreement concerning matters not covered by the foregoing declaration and not affecting the economic integrity of the industry, we advise our members to meet such of their employees who may be affected by such disagreement and endeavor to adjust the difficulty on a fair and equitable basis.

[1] Platform of National Metal Trades Association, 1920.

(8) In the payment of hourly wages or in the operation of piece work, premium plan, or contract system, this Association will not countenance any conditions of wages which are not just, or which will not allow a workman a fair wage in proportion to his efficiency.

D. Measuring Aids of Personnel Administration

Modern management is keen to take advantage of any devices which will enable it to see its problems in measurable, objective terms. Naturally, such devices are older, better developed, and more widely used in other fields of management than they are in personnel administration, for personnel administration is, after all, quite new. So also are the social sciences basic to personnel administration new as compared with the physical sciences used in production. Being new, their measuring methods are not well developed.

Precisely because it is probably the one field in management in which "measuring aids" are least adequate, let us see something of what the manager has at his disposal in this respect. If "measuring aids of management" are found to be already helpful in this new field, it will certainly give us increased respect for their helpfulness in older and better established functions.

There are, of course, three matters which need to be measured in personnel administration. The job, the worker, and the success with which these two are co-ordinated must all be measured. The problems below deal with these issues.

PROBLEMS

1. What do you think of the argument that "measurement discriminates against the weaker brother who should have a right to obtain the same pay as the stronger"?
2. "A change in attitude toward the medical examination is imminent. The medical examination at entrance will gradually assume its real function as a means of proper placing. It will result in benefit to both employer and applicant. The largely justifiable hostility of labor leaders that has accompanied its introduction will tend to disappear." Comment on each statement.
3. Make a list of ways of detecting fatigue. Ways of reducing it.
4. What information would you look for on a job analysis card if you were hiring (1) a crippled soldier? (2) an old man? (3) a woman? (4) a boy or girl?
5. What is the value of job analysis in transfer or promotion? In case of rush in certain departments?

6. Would a job analysis be of value in setting wage rates? Why or why not?
7. Is there one correct kind of job analysis? Might a job analysis for hiring purposes be different from that for training purposes? Just what is job analysis? What does it include?
8. Can job analysis be advantageously used in fields involving more personal elements than does machine work?
9. "Making the most of the labor supply at hand by making the labor specifications include what the worker need not be, may prove cheaper in the long run than the elaborate advertising and scouting schemes to which some employers have resorted to secure their employees." Show how this could happen.
10. "In a small organization it is frequently possible for the person in charge of employing to know the details of each type of position." Would a job analysis be of any value in such a business? Is it worth the cost and effort involved in making it?
11. "The employment man soon comes to know the type of man he desires for the jobs most frequently in need of filling. For these jobs the recorded analysis becomes superfluous. Employment men who have made job analyses have told the writer they do not use them as much as they had expected." Is this an argument against job analysis?
12. Make a list of the ways in which job analysis cards could be used in labor administration.
13. "The fact that the tendency is for factory work to become more and more simplified and to be reduced more and more to automatic routine by the subdivision of labor and by the development of semi-automatic machinery renders psychological tests unimportant because the work is made so simple that anyone can do it." Do you agree?
14. Quite a vogue is on for use of psychologists as (*a*) personnel managers, (*b*) advisers to personnel managers. What elements or parts of the personnel manager's job require the training of the psychologist? Do these constitute the major part of personnel work? How do you account for the way in which the business world has turned to the psychologists in this matter?
15. "There is every indication that vocational and industrial psychology will tend to exterminate the old try-out methods of selecting employees." Do you agree?
16. "The problem of selection can never be entirely solved by even the most cleverly devised psychological examination." Why or why not? What will solve the problem? Do you think it will ever be solved?
17. What seem to you to be the matters which can be well handled in the vocational guidance of one individual by another?
18. Which is more important in employment work, (1) a correct test of general mental ability, (2) a correct test of special mental ability?

19. What limitations do you see in the psychological test even when applied by experts? What limitations would be added if employed by laymen?
20. What are trade tests? What forms are there?
21. As a means of estimating the significance of the rating scale as a measuring device, rate a group of your teachers as to (*a*) teaching ability, (*b*) knowledge of subject. Why not rate them without the subdivisions mentioned?
22. The employment manager of a manufacturer of office furniture and filing apparatus has devised a plan whereby employees will be graded at the end of the first month and third months and of the first year according to dependability, intelligence, industriousness, neatness, cheerfulness, and activity. What do you think of such a plan?
23. "There are at least four views of a worker's capacity:
    1. What he thinks his capacity is
    2. What his associates think his capacity is
    3. What those above him think his capacity is
    4. What accurate measurement determines his actual capacity to be."

    Could a manager make use of all these?
24. Assuming that phrenology were well founded, scientifically speaking, what sort of service could it render in the administration of labor? What are the scientific objections to phrenology?
25. Answer the same question in the case of physiognomy.
26. As a matter of fact, are we influenced by matters of physiognomy? If so, why? What difference does this make to you personally? If you become a manager will you be so influenced? Should you be so influenced?
27. Write out your estimate of the application blank as a measuring device.
28. "In the prevailing undeveloped state of scientific tests of fitness the main reliance of the employment man must be on empirical devices for sizing up men. The most important of these and by far the most important of all the means of sizing up men is the interview." Do you agree? List other devices used and evaluate them.
29. "The employment manager should in conversation note whether the applicant is mental or manual, directive or dependent, original or imitative, social or self-centered, an indoor man or an outdoor man, a man of large or small scope, settled or roving in disposition, accurate or inaccurate, rapid or slow to co-ordinate facts, dynamic or static." Do you think this is a good method? What advantages or disadvantages does it possess? Of what value are the results obtained?
30. Two kinds of references are ordinarily required: (*a*) character references, and (*b*) references from former employers. Are these of any value? If you were hiring a man would you ask for references? Why or why not? How would you use them?

31. What is time study? Is it the same thing as motion study? Is time study something applicable only to labor?
32. "The day is coming when the world will demand that the quantity of the day's work shall be measured as accurately where one sells labor, as when one sells sugar or flour." Do you agree?
33. "No measurements, whether they be psychic or physical, are exact beyond a certain point." Why then is their value? How can they be checked?

22. STRENGTH TESTS IN INDUSTRY[1]

[The spring-balance test here described consisted of measuring by the balance the resistance the subject offered to pulls applied to certain muscle-groups. There are claimed for the test certain diagnostic values in such fields as physical classification of workers, criteria of fatigue, strain of night work, influence of environment upon strength and endurance, etc.]

Lovett and Martin's spring-balance muscle test, originally designed for the determination of the degree of recovery in muscles paralyzed in poliomyelitis, has been used with excellent results in our munition factories. This consists in measuring, by a very simple and quickly applied method, the strength of certain selected groups of muscles and computing from the figures thus obtained the total strength of the individual. Individuals are then classified into four groups: the exceptionally strong, the strong, the moderately strong, and the weak. The use of this test by Professor Martin under the Public Health Service has disclosed the fact that different specific industrial operations have different specific standards of strength, as is illustrated by the following table:

Operation	Average Strength in Pounds
Men:	
Rivet dipping	4870
Rivet trucking	4830
Hot forging	4370
Rivet shoveling	4260
Coal passing	4230
Capstan lathe (day shift)	4180
Planish seat	3930
Foremen	3770
Powder loading	3700

[1] Taken by permission from F. S. Lee, *The Human Machine*, pp. 6–9. (Longmans, Green and Company, 1918.)

Women:

Operation	Average Strength in Pounds
Drilling flash holes	2370
Mill percussion flash	1780
Welsbach foot press	1640
Drilling diagonal holes	1630

It is obvious that if the strength of any worker falls much below the standard for the task to which he has been assigned, he is undertaking work for which he is not physically fitted; and if his strength is markedly greater than that of his task, he is not economically placed. These disadvantages in assigning the worker to the task that is unsuited to his strength could be avoided if the spring-balance test should come into general industrial use.

See also p. 144. Physical Examination of Workers.

23. HOW INDUSTRIAL FATIGUE MAY BE DETECTED[1]

Given adequate equipment, adequate administration of the plant, and a proper spirit among the employees, fatigue is the greatest single obstacle to a maximum output. Fatigue diminishes output, not only indirectly, but directly by increasing accidents and the proportion of spoiled work and by causing sickness and absences of employees. Itwill, therefore, be profitable to employers, to employees, and to the nation itself, to inquire into the ways by which fatigue may be reduced.

Everyone knows that a certain degree of fatigue is the normal result of bodily activity and is harmless. But it is not so generally recognized that the onset of over-fatigue may be greatly hastened, and that through it deleterious effects on both the worker and the plant may be caused by the conditions of work inside the factories, or by the occupation, habits, and conditions of living of the workers outside the factories, or by both.

In order to be sure that an individual is really fatigued, objective methods of measurement must be used—one often feels tired without actually being so, and likewise fatigue is often present before it is recognized by the individual. Fatigue may be detected by various tests, some of which have been studied so carefully and so improved that they can now be considered as fairly accurate and useful for practical purposes. Different methods are applicable to different cases.

[1] Taken from Reprint 482, *United States Public Health Service*, pp. 5–11. (Government Printing Office, 1918.)

Amount of output.—One of the readiest means of detecting fatigue is by keeping a record of the output of the individual employee by the hour, the day, or the week and observing its course. A falling off in the output, when not explicable by other changes in the conditions of the work, indicates fatigue. Where the duration of the working period has been changed, fatigue can also be tested by comparing the average output per hour under the earlier and the later schedules.

Amount of power used.—A fall in the amount of electrical or other power consumed in a factory, or one of its departments, is often an excellent index of decreased output and thus of the fatigue of the workers. Lessened consumption of power must of course be discounted where it results from temporary shut-downs or other obvious causes.

Other indicators of fatigue.—Fatigue is also often indicated by the amount of spoiled work turned out by the workers, by the number of accidents to the workers occurring during a working period, by the number of absences from work, and in extreme cases by records of sickness.

Laboratory tests of fatigue.—There are various tests of the presence of fatigue that have been supplied by the laboratories, some of which are applicable to industrial workers. These concern the muscles, the nervous system, sight, and hearing, and certain chemical changes within the body.

See also p. 140. The Maintenance of Physical Fitness.

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24. JOB ANALYSIS[1]

The committee found that there existed a misunderstanding as to just what job analysis is. In some cases it was found that members would assert they were using job analysis when they were merely making a mental analysis of the various jobs and occupations in their establishments, and it was also found that there was a lack of standardization, different people using different names for the same job or giving the same name to entirely different jobs.

The investigation showed the subject had three distinct phases: (1) job classification; (2) job analysis; (3) hiring specifications, also known as job specifications.

[1] Report of the committee appointed by Chicago Council, National Association of Employment Managers. Taken from *Personnel*, II (1919), 10.

Job classification is the segregation into groups, under common designation, of all positions requiring similar skill, training, or ability, and having approximately the same relative value to the industry.

Job analysis is the systematic survey, examination, evaluation, and recording of the various components of a job as relating to, and reacting upon, the worker.

Hiring specification is a record showing the essential requirements of each job, which are solely necessary for the proper selection and placement of an efficient worker.

REASONS FOR MAKING AND RESULTS ACCOMPLISHED

1. Job classification, job analysis, and hiring specifications will assist the employment department in the selection of employees.

2. They furnish more accurate data than are usually available to explain the job to the new employee.

3. They give information about training methods, and help to develop new and better methods.

4. They furnish basic data for the development of systematic promotion schemes.

5. They furnish data for the standardization of occupation and job names.

6. They furnish some of the data upon which to base rate and wage schedules, and especially assist in the standardization of rates between departments for the same jobs.

7. They will point out disagreeable features of a job as a basis for the improvement of working conditions.

8. They will give a good picture of the job to those not directly in contact with it, but still in need of an understanding of the job or occupation, as nurses, doctors, compensation departments.

9. It will bring the employment department and foremen or department heads together on a basis of mutual understanding through the close co-operation and contact necessary when making job classification and analysis.

10. They will give the foreman a better understanding of the jobs, as he will be forced to think about them in a comprehensive way and not only from the viewpoint of production. Consequently the relationship between foremen and workmen will be closer and disagreements fewer.

11. They will give a permanent record of the requirements for a job, making turnover in the employment department a less serious matter.

12. They will, when more generally developed, give valuable data for the agencies of vocational guidance.

13. Made on a comparable basis, they will give data to stabilize rates in similar industries.

14. They may be used in the movement for the elimination of unnecessary fatigue.

15. They will give data which will assist the movement for accident prevention and sanitation.

16. They will suggest improvements in equipment and manufacturing methods.

17. They will furnish data useful in the placement of industrially disabled men.

18. They are the first steps necessary in determining the basic requirements in introducing any mental tests and trade tests in the process of proper selection and placement and careful follow-up and adjustment.

JOB CLASSIFICATION

There appears to be agreement in the various sources consulted that some form of classification of the jobs coming within the jurisdiction of the employment department should precede the actual making of a job analysis and specification. The extent toward which this classification is carried differs, however, in different types of business.

The following steps describe the general procedure for a preliminary classification:

1. Take one department at a time and list all jobs for which somebody is usually hired.

2. Decide upon a distinct title for each job, using, wherever they are clear, titles now in use.

3. Group jobs which are identical or very similar together under one title, especially those performed by the same type of employee, or if the job is one of several jobs of similar nature which the same employee performs by changing around from job to job. This will simplify the work of analysis, especially the specifications, as for all practical purposes the employment department is interested in the job, as it represents a type of worker for this job.

4. Group together jobs which are of the same general occupational nature, such as assembling jobs, machine-operating jobs, maintenance jobs, etc., keeping each job distinct, however. This will facilitate analysis, as certain factors will affect all jobs of the same general type

5. The preliminary classification is done for the purpose of facilitating the making of job analyses and hiring specifications, and should be general, details left to be worked out by them.

JOB ANALYSIS

Job analysis of all jobs listed in the classification is made on the basis of a definite outline, including a standard set of points to cover all jobs. The method of making this analysis and the various steps will, of course, differ in various types of organizations, due to local conditions, but the following points were taken from the instructions of one employment department investigated, to the ones making a job analysis:

1. Begin with one department in your factory which is best known to you, and where you are sure of the co-operation of the foreman, assistant foreman, and other employees who may have to be consulted.

2. Observe the jobs to be written up, notice what is done and how it is done, type of employee doing the job, working conditions, and any other factors shown in the outline below.

3. Write up all you know about the job or have learned from your own observation, following the outline shown below.

4. Get together with the foreman and sell to him the idea of job analysis, pointing out to him the value to his department in having you secure full knowledge of the requirements, the value it is to the company as a whole in furnishing information as a basis for the standardization of names and rates, the value to the factory, the safety department, and nurses in having detailed information about each job as to the working conditions, hazards, and any other arguments which you may feel will assist in selling the idea.

5. Secure from your foreman as complete a statement as possible on all the points to be covered. Be sure to evaluate his statements and discriminate between facts, opinions, and bias or prejudice.

6. If advisable, talk to the assistant foreman, die setters, linemen, and experienced employees about the job.

7. Consult the master mechanic on questions of equipment, the efficiency man, spoilage clerk, and superintendent, getting the requirements of the job from their particular angle and viewpoint.

8. Consult the safety man as to the hazards of the job.

9. Consult the nurse or doctor as to the health and physical requirements and strains they may have observed.

10. Check at all times by observation of the actual conditions, and give statements of facts instead of opinions wherever possible.

11. Write your analysis up from the above information. Give in as few words as possible an accurate, reliable, simple, and adequate description and definition.

12. Submit to the foreman for criticisms and suggestions, and if finally agreed upon by the foreman and employment department, submit to the superintendent for final approval.

13. The information should be written up on plain sheets of paper and arranged in paragraphs under the headings given below to facilitate easy reference to any particular points.

The following is a list of points which are suggestive of what such a job analysis should include:

1. *Department and foreman.*

2. *Job name.*

3. *Definition of name.*—By this is meant a short, concise explanation of the job name. This is often termed the duties.

4. *Description of duties.*

5. *Wage scale.*—*a*) Starting or basic wage. This should be stated in form used as a basis for computation, as, for example: 40 cents per hour, or $18.00 per week.

b) Advancement, showing schedule of increase, where such is in effect, and limits, where such have been established.

c) Piece-work bonus, or premium. Where these forms of incentive plans are in effect, take average earnings the employee can make, and the limits.

d) Overtime rate, Sunday, and holiday rate.

6. *Hours per day. Per week.*

7. *Continuity of employment.*

8. *Promotions.* Here should be stated the line of promotion, as well as the factors on which it is dependent.

9. *Standards of production or output, where such are available.*

10. *Working conditions*, as to:

a) Ventilation
b) Temperature
c) Illumination
d) Cleanliness
e) Physical layout
f) General surroundings
g) Fire hazard
h) Accident hazard
i) Health hazard
j) Posture
k) Fatigue
l) Strain
m) Distractions
n) Monotony

11. *The effects of the job on the character of the worker.*
12. *Requirements, physical and mental.*
13. *Method of selection.*
14. *Sources of supply.*
15. *Method of training.*—Here should be stated length of time necessary to learn the job, who gives the training, and the various steps of the training period.

HIRING SPECIFICATIONS

While the job analysis gives comprehensive information regarding the job to its minutest detail, it is not practicable to the busy employment man or interviewer, who may have to memorize the information regarding a large number of jobs, and wishes to use the results of the analysis at the time of selecting and hiring a man, both for the purpose of recalling the qualifications as well as having such definite information as should be told the new man before he starts to work. It therefore was found preferable to make up a record which will permit tabulation of a résumé of the information secured through the job analysis.

See also p. 588. Measuring and Communicating Aids: Time Study.
p. 591. Measuring and Communicating Aids: Classification and Symbols.

25. SOME SAMPLE ANALYSES AND DESCRIPTIONS OF OCCUPATIONS

A[1]

Dept..... Job Name.....
Div..... Job Symbol..... .....

WORKING CONDITIONS:

Permanent	Night	Clerical	Standing	Heavy
Temporary	Day	Mechanical	Sitting	Medium
Overtime	Part time	Labor	Stooping	Light
Variety	Quick	Clean	Office	
Routine	Slow	Dirty	Shop	
Exacting	Dangerous	Hot	Outside	

PERSONAL QUALIFICATION (Qualify only those which are essential):

Male	Age.....	Appearance.....	Grade school.....Years
Female	Height.....	Nationality.....	High school.....Years
	Weight.....	Eyesight.....	College..... .....Years

[1] Curtis Publishing Company.

EXPERIENCE:

Special knowledge and training either with methods or machine.....

.....

Can inexperienced man be trained..... If so, how long will it take....

WAGE AND HOURS:

Time rate	Starting wage.....	In.....		In.....
Piece rate	Next advance	Hours	Sat.	
Prod. bonus	Time or merit	Out		Out.....

GENERAL:

Next opportunity.....

Related jobs. .....

What is most common reason of exit.....

What are the duties on this job? Necessary qualifications?

B[1]

BLACKSMITH

Other names by which occupation is known:

Occupations most nearly allied:—Anglesmith, hammersmith, toolsmith, shipsmith, horseshoer, forger (liner).

Trade requirements:—A blacksmith must be capable of doing welding and able to make all kinds of medium or light machine and hand forgings from drawings, templates, or samples; should be familiar with coal, coke, gas, and oil furnaces; have some experience on steam or power hammers; have a good knowledge of heat treatment of steel, including oil and water tempering and hardening.

Education:—Common school.

Physical requirements:—Strength and endurance; good eyesight, as a blacksmith's duties require him to be looking into forges or furnaces constantly.

Mental requirements:—Higher than average intelligence.

Experience:—Should have served as an apprentice in general blacksmith shop.

Entrance requirements for training school:—Common or high-school education; shouls have good health, strength, and be of robust stature.

Rate established.

[1] Taken from *Aids to Employment Managers and Interviewers on Shipyard Occupations*, Special Bulletin, Series on "Employment Management in the Shipyard." (United States Shipping Board Emergency Fleet Corporation, 1918.)

26. THE FIELD OF THE PSYCHOLOGICAL TEST[1]

The popular conception involves a process of "pigeonholing"—fitting an individual into an occupation which is supposed to be the one for which he was "cut out." This doctrine may be proved fallacious on several grounds. The objections may be couched in ethical, sociological, philosophical, or psychological terms. This discussion will take the standpoint of experimental psychology, and from this aspect the objections appear especially vivid.

A prime consideration that is neglected by the popular calculations concerns allowances for probability of error. Errors of observation are inevitable in all measurements. A single observation is less reliable than a series of observations. For this reason it is possible that vocational tests may require to be given several times in order to reduce this error to a minimum.

A further objection to a single-test system is that it makes no provision for the amount of improvement which an individual is capable of making in a given activity. If experimental psychology has shown anything, it has demonstrated that capacity for improvement varies greatly with different individuals, and the initial standing in a test does not indicate what the standing will be in successive performances. This brings up the question as to how far the individual may be trained in an activity, and when one observes the astounding increases in capacity displayed in everyday life, one hesitates to limit the individual to any single vocational possibility.

The current doctrine is further befogged by its neglect of the volitional factor in human endeavor. Behind all specific capacities lies something that is loosely called will, character, volition, etc. It has to do with the exercise of mental traits which are not directly measurable, at least not readily isolated. Psychological tests appear to be limited when one undertakes to measure such traits as industry, persistence, honesty, etc., and the limitations make it impossible to predict what reaction will take place in future situations.

Some attempts at vocational guidance are based upon interest as the ultimate criterion of aptitude. In evaluating this factor one should keep in mind several points. First, some people have no interest of vocational significance. Here interest as a criterion obviously fails. Other individuals have but one absorbing interest. Into this

[1] Taken from H. D. Kitson, "Psychological Tests and Vocational Guidance," in the *School Review*, XXIV (1916), 207–14. (The University of Chicago Press, 1916.)

class fall the geniuses, and here interest is very properly regarded as an indication. In the majority of cases, however, a number of interests are present. They may be of equal strength. They may be in related fields and reinforce each other, or they may be in unrelated fields and antagonize each other. The perplexing thing about these cases of multiple interests is that the individual himself is unable to tell which is his strongest interest. How unstable it is, then, as a criterion of vocational aptitude. Finally, it should be pointed out that interests are not always fixed things. They are extremely volatile.

The psychological methods of studying interests fall under two heads—objective and subjective. The first involves the presentation of interesting stimuli to the individual and the measurement of his reactions. Objective methods are so slightly developed that little can be said on experimental grounds either for or against them. Their utility is questionable, however, inasmuch as the stimuli must necessarily be so simple in laboratory procedure as to have little vocational significance.

The subjective method is largely used in the practice of vocational guidance, usually taking the form of a questionnaire modeled after the pattern set by Professor Parsons. This method has value when used under laboratory conditions, but experimental psychology has shown that the introspections of an untrained person are usually not very illuminating, at least in revealing deep motives and hidden desires.

The conclusion to be drawn from the foregoing considerations is that any scheme of vocational guidance that uses interest as the chief arbiter in determining vocational fitness is on the wrong psychological basis.

Vocational guidance will have to be regarded, not as a process whereby one is designated as fitted by birth for one occupation and not fitted for another, with psychological tests as the chief instruments of selection; a more fruitful conception of the entire process is to regard it as *monitory* in nature. The individual should be measured from every standpoint—physiological, psychological, sociological, and economic. Each of these views of the individual is only partial and shows his standing in relation to the world in a specific mode. All these views must be taken in order to ascertain his true relation.

This view immediately disposes of the demand that the technique of vocational guidance be developed exclusively by the psychologist.

He is not more responsible for its advancement than is the sociologist, the physiologist, or the economist. The mental process constitutes only one phase of the occupational activity.

In making positive suggestions as to the probable utility of psychological tests in vocational guidance, it is difficult to speak with assurance because of the embryonic condition of mental tests. Most persons will agree that it is possible by means of psychological tests to distinguish between an individual who is characteristically slow and one who is characteristically fast; between one characteristically accurate and one characteristically inaccurate, as these characteristics are in extremest form. It is also possible to grade people with respect to the presence of certain qualities of ingeniousness, ability to adjust to new situations, etc. The methods for accomplishing these ends, however, are still far from standardized, and vast areas of technical ground must be covered before the tests will have vocational significance.

27. METHODS IN VOCATIONAL TESTING[1]

The vocational miniature.—There is first what may be called the method of the vocational miniature. Here the entire work, or some selected and important part of it, is reproduced on a small scale by using toy apparatus or in some such way duplicating the actual situation which the worker faces when engaged at his task. Thus McComas, in testing telephone operators, constructed a miniature switchboard and put the operators through actual calls and responses, meanwhile measuring their speed and accuracy by means of chronometric attachments.

The vocational sampling.—Closely related to this method of miniature performance is that of taking an actual piece of the work to be performed and sampling the candidate's ability by his success in this trial. Thus, in connection with the recommendation of clerks and assistants from among boys in commercial high schools it is common to test their ability from time to time by assigning them small pieces of work such as that which they might later be required to perform in business offices and stores. Finding addresses and numbers in a telephone directory, carrying out involved verbal instructions and directions from memory, computing calculations, making out a trial bal-

[1] Adapted by permission from H. L. Hollingworth, "Specialized Vocational Tests and Methods," in *School and Society*, I (1915), 918–22. (The Science Press, 1915.)

ance, a trial chemical analysis, etc., are common forms of this type of test.

The vocational analogy.—A third method has been that of analogy. Some test is devised which bears a fancied resemblance to the sort of situation met by the worker in the given occupational activity. The material is new, but the attitude and endeavor of the worker seem to be much the same. There is, indeed, usually a tacit or expressed belief that the same simple or complex mental processes or psychological functions are involved in the two cases, although seldom has the precise nature of these functions been clearly stated. Thus girls employed in sorting ball bearings, and also typesetters, have been selected on the basis of their speed of reaction to a sound stimulus. Münsterberg has suggested that marine officers who can quickly perceive a situation and choose an appropriate mode of reaction to it may be selected by letting candidates sort a deck of cards, bearing different combinations of letters, into their appropriate piles. The same investigator has described a test for motormen which, while being neither a miniature of their required work nor yet a sample of it, is said to produce in them much the same mental attitude. In another case telephone operators were tested for speed in cancelling certain letters from a newspaper page, in the belief that this work involved an ability that is required also at the switchboard, although there directed toward different materials. McComas has described a dot-striking test for measuring accuracy of aim and co-ordination, essential factors in manipulating a switchboard.

Miscellaneous empirical tests.—Finally there are cases in which tests having vocational significance have been sought by purely haphazard and empirical ways. Thus Lough, having devised a form of substitution test in which certain characters had always to be replaced by certain others, according to a prescribed key, proceeded to apply it to groups of commercial students. Speed of improvement was chosen as the thing of interest in this test. Measures of this capacity, as shown by repeated trials with the same test day after day, were then compared with measures of ability in different types of work in which the students were engaged. It was found that the test records agreed very closely with the abilities in typewriting and fairly closely with abilities in stenography and business correspondence, whereas there was not such definite relation found between the test records and ability in learning the German language or in mathematics. The test is consequently recommended as a useful means of detecting

typewriting and stenographic ability. It is not pretended that the test is either a miniature of the work of such calling, nor that it is a fair sample of such work, nor even that it involves precisely the same mental functions that come into play in such work. The test records and ability in the particular type of work show high positive correlation, so that an individual who is good or medium or poor in the one is, as a mere matter of fact, also found to be good, medium, or poor in the other. Hence, without further analysis, the one may be used as the sign of the other.

The *miniature model* has the advantage of concreteness and apparent relevance, but, as Münsterberg points out, a reduced copy of an external apparatus may arouse ideas, feelings, and volitions which have little in common with the processes of actual life.

The second method we have described, viz., that of using as the test a real *sample of the work* done, has certain very obvious advantages. On the other hand, for the vocational test of this type to be at all significant, either the sort of work involved in the occupation must be fairly uniform and homogeneous in all its different circumstances (as in the case of typewriting at dictation, or in the work of filing clerks, accountants, etc.), or else there must be included a large number of samples, representing all the various unrelated sorts of work. Moreover, in neither case is the test in any peculiar sense psychological. Such tests could perhaps be best conducted by the employer himself. In fact, employment on trial, which is a common method of selecting operatives and assistants, is a time-honored form of this test, which is not necessarily improved on either by calling it psychological, or by putting it in charge of a general expert, or by removing it to the laboratory.

The third form of procedure, that of *analogy* (duplicating the inner mental attitude), is full of all sorts of difficulties and sources or error, many of which are, at the present stage of our knowledge, irremediable. In selecting a new test which shall involve the same mental attitude and call for the exercise of the same psychological functions as are needed in the work itself, we are handicapped by the unreliability of the introspection of the examinee and also by our inadequate ability to recognize, identify, and classify psychological functions even when we are in their immediate presence. The statement of motormen that the manipulation of a crank in connection with a strip of checkered paper makes them feel quite as they do when guiding their cars through a crowded thoroughfare is far from a guar-

anty "that the mental function which they were going through had the greatest possible similarity with their experiences on the front platform of the electric car." It is much more conceivable that the "mental attitude" referred to was merely the vague feeling that "Something is happening now," "This keeps me busy," or "What a nuisance this thing is." And even if we knew the mental functions involved, as would be demanded by the method of the vocational psychograph, we are still a long way from the time when we can exhibit even a single psychological test and state just what function or functions its performance does or does not, may or may not, involve. Indeed, we do not even know what the various distinct mental functions are, or whether, as a matter of fact, there are such distinct functions.

After all, the miscellaneous, random, and purely *empirical method* of Lough, Lahy, and Woolley seems to be the most promising experimental procedure for the immediate present and perhaps for some time to come. This method is, to be sure, but a rough, provisional, and unanalyzed expedient. It calls for long and patient co-operative labor. It does not at once afford us the systematic scientific insight which we may wish we possessed. But it will at least save us from the delusion that we already possess such insight, and it should serve to check the fervent and quasi-religious zeal that leads us to mistake prophecy for service.

28. ARMY INTELLIGENCE TESTS AND TRADE TESTS[1]

[The reader should keep in mind the fact that the *intelligence* tests here discussed were given to ascertain the general level of ability. They did not seek to measure *specific* abilities.]

In determining the qualifications of men coming into service, the army used the physical examination, the interview, the intelligence test, and the trade test. The interview and the physical examination are familiar devices to the employment manager, and so, although there are many points of interest connected with the use of these methods in the army, little more will be said about them here. The intelligence test and the trade test are probably more novel; certainly they have not come into general use as yet in industry.

[1] Taken by permission from Beardsley Ruml, "The Extension of Selective Tests to Industry," *The Annals of the American Academy of Political and Social Science*, LXXXI (1919), 39–46.

The army intelligence tests were devised and used by the army so that information concerning each man's mental alertness might be at hand to aid in assigning him to duty. The actual form which the tests took was determined to a large extent by several aspects of the army situation. In the first place, the tests had to be given with great speed. It was not uncommon to test and to report on 2,000 men within a space of twenty-four hours in a single camp. In the second place, the tests were scored by a staff that was of necessity continually changing. And finally, the method of testing had to be so adapted that men who could not speak or read English might be satisfactorily rated.

As a result of these tests each man received a rating: A for the very superior; B for those decidedly better than the average; C+, C, and C− for those of average ability; D and D− for the inferior; and E for those who did so poorly in the test that arrested mental development was suspected.

The ratings of mental alertness were useful in three ways. In the first place, they indicated those individuals of such inferior mental ability that their presence in a unit would retard training, to a prohibitive degree, men who might even become a menace to the unit in critical situations. Such men were either assigned to routine tasks which they were competent to perform or they were discharged from the army. In the second place, the ratings showed men of superior grade who might be considered for advancement. They pointed out to a commanding officer certain individuals for his special observation, sometimes with startling results. In the third place, the ratings were used to equalize the alert and the sluggish in the companies of a regiment. It was found that if men were assigned to companies in a hit-or-miss fashion so far as mental ability was concerned, some companies of the regiment could be trained with great speed, while the training of others seemed impossible. It was found that these differences were paralleled by differences in the average ratings of the companies, and after shifts in personnel were made which equalized the average intelligence ratings, the training of the regiment as a whole proceeded in a decidedly more satisfactory way.

The uses made of intelligence tests in the army suggest that similar tests might be of considerable value to industry. The first use that at once suggests itself is in relation to hiring. Mental alertness is clearly an attribute that brings about success or failure at different kinds of work, and the employment manager who will

inform himself of the amount of intelligence that various jobs require can assure himself that each applicant is at least intelligent enough so that he will suffer no handicap in becoming a satisfactory employee because of a slow or retarded mentality. The converse is also true, that applicants of superior intelligence need not be hired for positions in which high mental ability may be either unnecessary or misdirected.

The usefulness of intelligence ratings only begins with the hiring of the applicant; they may be of considerable importance in readjustments in the working force itself. Clearly, in slack times when the laying off of groups of men becomes imperative, care might be taken that mental ability in its relation to productivity be given its proper weight in deciding which individuals shall stay and which shall go. In conditions where the manufacture of a new product involving new processes and technical operations is begun, those men on the present force whose mental alertness gives indication of quick adaptability to new work and unfamiliar situations might be selected. When it is desired to select or to encourage certain of the less skilled operators to study in the company's technical schools, better results would be obtained by choosing those whose intelligence rating gives promise of quick learning and an appreciation of the advantages of special training.

The practical applications of intelligence tests so far mentioned are perhaps fairly obvious. A further use, somewhat less certain of immediate value, is suggested from the value of army intelligence tests in balancing the companies of a regiment. It is conceivable that such balancing would not only be profitable from the point of view of immediate production, but that a major cause for industrial unrest and discontent would be attacked.

Great care must be taken to make sure that any intelligence test proposed for use in industry is really able to do the work expected of it. There is danger that inexperienced enthusiasts, wholly unconscious of test technique and test limitations, will offer broadest panaceas for all the difficulties of mental measurement. It should be remembered that the army intelligence tests measure general mental ability, not specific mental traits. It should also be borne in mind that the success of the army tests was due to the great range of mental ability received by the army. Parallel results have never been achieved where tests have been used as a selective agency, on a group of relatively small intellectual range. Further, the army tests, determined as they were by the fixed conditions of military

affairs, are probably not the most satisfactory kind of tests for industrial use.

The army trade tests are quite a different story. Among the various items which were recorded on each soldier's qualification card were the very important ones concerning his occupation in civil life and his proficiency in these occupations. The information on these points was at first extracted by means of an interview. It was soon discovered that the interview was unreliable, not hopelessly so, by any means, but just unreliable enough to give cause for trying to improve the system. The reason for the inaccuracy was not lack of training on the part of the interviewer; it was rather the weakness that inheres in the best conducted of interviews. Soldiers, like all men, are unable to judge accurately of their own ability; sheer mendacity was fairly prevalent, especially when there was a tip that this trade or that was required in France; and honest misunderstandings were frequent.

Trade tests seemed to be a way of bettering the situation, tests that would check up a man's statement of what his occupations were in civil life and of what he claimed his skill to be. As in the case of the intelligence tests, trade tests had to fit into the army scheme of things. This meant that they had to be given in a short time, not to average more than ten minutes per test, that they be given by examiners who might have no knowledge of the trade whatever, and that they require none of the expensive machinery and equipment that is the complement of most trades. [The tests were of three kinds, (*a*) oral, made up of certain "key" or diagnostic questions (*b*) picture, where questions were based on picture shown, and (*c*) performance tests when the person being tested made some object requiring skill in the basic operations of the trade.]

Several applications of the trade-test method to industry are suggested from its uses in the army. The three phases of employment work that seem most immediately concerned are hiring, transfer, and training. Trade tests have an immediate and obvious use in industry in aiding in the selection of new employees. They are the natural method of securing very essential occupational information, of ascertaining whether this particular applicant really has the skill that his age, experience record, and last wage seem to indicate. Certainly a direct method of measuring trade ability is to be preferred to an indirect method of inferring it.

Since trade tests can be constructed which will measure proficiency in the various activities that are commonly implied by the

name of an occupation, they would be valuable in all matters involving shifts in the working force. A knowledge of each man's strengths and weaknesses within the broad range covered by his trade would make more intelligent and less uncertain the transfer of particular men to different work. The trade-test rating should also be one factor in determining which workers should be retained in dull periods, for the nucleus that is left in the industry after the cut is made is the cornerstone of the new operative unit. It is important to know that, from the technical side, the stronger elements of the old unit are included in this foundation.

The information that would be given in the trade-test record is intimately connected with the educational program of an industry. Isolated weaknesses in the chain of an individual's technical strength may be removed. Furthermore, a systematic program directed to prevent stagnation on the job would give to industry an increasingly flexible and effective working force and would give to the worker the pride in his skill which comes from watching its continuous growth.

Again the warning against the amateur must be sounded. Not even the trade tests used so successfully in the army are capable of yielding the results pictured above. Only through experimentation will the ultimate goal be reached. Army trade tests have done their part in pointing out the way which may be followed.

The intelligence tests and the trade tests are part of one technique. Both have for their function the measurement of phases of human qualifications that are vitally important in the selection of employees, in their assignment to work, in their transfer from department to department, and in further education and training. The intelligence test gives a rating of general mental ability; the trade test gives a rating of specific technical skill. The two together picture an individual's status in those traits which most definitely condition his effectiveness in industry.

29. WHAT PHRENOLOGY AND PHYSIOGNOMY CAN CONTRIBUTE[1]

Underlying all of the various phrenological systems were four common assumptions which, briefly stated, were:

1. That such cerebral localization as exists is of fundamental and specific traits of character or types of ability, such as secretiveness,

[1] Adapted by permission from H. L. Hollingworth, *Vocational Psychology*. (D. Appleton and Company, 1917.)

circumspection, love of babies, generosity, veneration, constructiveness, etc.

2. That the more developed any one of these given traits is, the larger will be the supposed area of the brain which contains its supposed organ.

3. That, since the skull fits fairly closely to the brain surface, the relative development of a given portion of the brain will be indicated by the relative prominence or size of the different parts of the cranium, so that the degree of possession of the trait may be judged from an examination of the exterior of the skull.

4. That the occasional casual observation of coincidence between particularly marked mental qualities and particular cranial characteristics is a sufficient basis for inferring universal and necessary connection between these two features.

Each of these assumptions involves obvious error and misapprehension in the light of what is now known concerning the nature of the human mind and the structure and functions of the brain. In order that these fallacies may be clearly disclosed the four main assumptions will be examined independently in the order in which we have here presented them.

1. In the first place, the only sort of localization of functions that has been authentically established is the projection, upon the brain structure, of the other parts of the organism, and the localization of sensory-motor centers which function in the connection of these various organs. Thus it is known that each of the principal groups of muscles of the body has its so-called center in the brain. The same thing is true of the sense-organs, as the eye, ear, etc. Each incoming sensory nerve tract runs to or through some portion of the brain. The cortex, or outer surface of the brain, may thus be conceived as a sort of terminal station for nerves from other portions of the organism, a sort of projection-center which enables them all to take part in a functional unity of action. The functions which can be said in this sense to be localized in the brain are such sensory-motor capacities as the ability to raise the right arm, the ability to balance the body when standing erect with eyes closed, the ability to see, the ability to move the eyeball, the ability to feel pain in a certain area of the skin, the ability to articulate words, to understand spoken or written language, to call up a visual memory of a particular thing previously seen, etc.

The integrity of various parts of the brain is essential to the proper co-ordination of all the sensibilities and responses of the individual. Traits of character and types of ability, however, depend on the characteristic modes of reaction of the organism as a whole to the factors of its environment. Thus generosity as a human trait does not depend on the massiveness of any set of muscles, nor on the keenness of any sense-organ, but upon the characteristic type of reaction and motivation which the individual as a whole displays. Jealousy, love of children, destructiveness, etc., are characteristic modes of behavior of the whole organism, and depend upon reactions which the given situation evokes, and not upon some special organ.

2. As to the supposed correspondence between size and functional capacity, no evidence has been presented which demonstrates that even the strength of a muscle or the keenness of a sense-organ depends in any way on the absolute size of the brain-area concerned with it. Nor has evidence been presented to prove the existence, within any given species, of correlation between volume, shape, or weight of the brain-tissues and even the more general traits of character or ability. In the absence of such evidence we are led to believe that functional capacity depends on complexity of structure, chemical, molecular, and functional, rather than on the factors of mass or shape. But even the nature of these correlations is as yet largely unknown. The important point in the present connection is that, for the purposes of vocational psychology, the practices of phrenology are based on evidence no more relevant to its pretensions than were the "proofs" pointed to by palmistry, horoscopy, and prenatal magic. Through cranial measurements alone it is impossible to determine with certainty the race, age, sex of an individual, or even, indeed, whether he was a prehistoric savage, an idiot, or a gorilla.

3. As for the third assumption of phrenology, namely, that brain development is reflected in the cranial size or protuberances, it should be sufficient to point out that even if this were so it would be meaningless for our purpose, since we are compelled to abandon the belief in a relation between mass of tissue and even the simplest sensory or motor capacity. But such further disproof as may be required is readily furnished by an actual attempt to remove from their cranial boxes the brains of various animals, and by noting that the shape and thickness of the bones gives little indication as to whether brain tissue,

cerebrospinal fluid, or supporting tissues are to be found underneath a given protuberance or depression.

4. The fourth assumption of phrenology, that sparse and casual observation of striking cases is sufficient ground for generalization, we should be able to dismiss at once as utterly inadequate and miscalculated. It is impossible to find consistent recorded instances in which groups of individuals, selected at random, with definitely determined and measured mental or moral characteristics, have been shown to confirm, by their cranial geography, even the most elementary doctrines of that phrenology which still offers to diagnose the individual's psychic constitution and to commend to his future consideration the vocation of engineering, publishing, or preaching, as the case may be. Very often practicing phrenologists and phrenological vocational experts seek to justify their operations and pretensions by pointing out that they do not rely solely on the cranial geography, but more often on other characteristics of the individual's body, such as the concavity or convexity of his profile, the shape of his jaw, the texture of his skin, the shape of his hands, the color of his hair and eyes, the proportions of his trunk, etc.

There is a very widespread belief that many mental and moral characteristics betray themselves in special facial items. The shifting eye, lofty brow, massive jaw, thin lips, large ear, protruding or receding chin, dimple, wrinkle, tilted nose, thin skin, prominent veins, and many other characteristics have come, in fiction and in table-talk, to symbolize specific characteristics. The same thing is true of the shuffling gait, the erect body, the protruding paunch, the curved shoulders, enlarged knuckles, stubby or elongated fingers, the short neck, the long arm, and the manner and rate of stride. It is but a step from these to the signs afforded by clothing, its selection, care, and mode of wearing.

1. It is first of all true that many of these marks are the result of habitual activity, and in so far as they originate in the expression of a trait, they may be said to be signs of it. That the studious come to be round-shouldered, the cheerful have smooth countenances, the guilty to have furtive eye-movements, may well be expected. But it is quite another thing to reverse the proposition and to take stooped shoulders as a universal sign of academic interests, dimples as a sign of guilelessness, and nystagmus as the symptom of a criminal past. It is, however, often safe to use these traits as reliable signs of the estab-

lished general habits and attitude which they express. We have all done this since earliest childhood; yet any attempt to classify formally the signs and effects of habit and constant expression would be pedantic.

Somewhat more hopeful is the reliance on expressive movements as indicative of passing and transient emotional states and attitudes. Prolonged intimate acquaintance with an individual's emotional experiences and expressions may in time reveal to such an observer the deeper lying and more permanent affective trends, the moods and sentiments which indicate what we are accustomed to call the temperament of the individual. Insight into the nature of these expressive movements is one of the useful things to be derived from long and patient study of human nature, both at first hand and through the classical descriptions of emotional expression. The more one observes and the more individuals he observes, the more he is impressed with the final variety and informal complexity of these expressive movements, and their dependence on a vast detail of circumstance, which again forbid rule-of-thumb formulation.

2. Another apparent source of these beliefs is in analogy. The clammy hand, the fishy eye, the bull neck, the "blotting paper" voice, the asinine ear, the willowy figure, the feline tread, and scores of such phrases indicate that these characteristics remind us definitely of various species or objects other than the human being, and that we expect to find back of them the characteristic traits, habits, and instinctive tendencies of those species. We seldom proceed so far as to check up our expectations with facts, under controlled conditions.

3. The affective value of these analogies and their incorporation in poetry, song, and fiction as adequate figures of speech lead us to react to these traits in ways determined largely by the traditional usage. We are humble before the "high-brow," merry in the presence of the dimpled, cautious and prudent before him of the shifting eye.

4. Another source of these notions is mainly responsible for such of them as refer to definitely undesirable traits. This is the belief, so well played upon by the school of Lombroso in criminology, that many of these characteristics, along with the so-called physical stigmata, are indicative of a degenerative or atavistic trend in the constitution of the individual. Suffice it to say that we now understand that the underlying truth of the matter is only that these

stigmata are somewhat more frequent among the vicious, degenerate, and defective groups than they are among people selected on the basis of their morality and intelligence. The criminally inclined individual may possess no stigmata, while an Abraham Lincoln may possess several of them, and in marked degree.

5. A further source of these physiognomic beliefs may be discerned: namely, the fact that the features of a stranger are very likely to call more or less clearly to our memory some other acquaintance whose traits we know, to our sorrow perhaps, and whose features or manner or voice or apparel chance to be very similar to that of the stranger. At once we are inclined to endow the stranger with the character of the individual he resembles. We seldom accurately check up these impressions on the basis of subsequent discovery. Indeed we are much more likely to evoke the suspected traits by our own attitude and by our treatment of the stranger, and we are eager to pounce upon any act that may be construed as a confirmation of our snap judgment. It is obvious that these impressions will vary from individual to individual and that any attempt to formulate them would expose their fallaciousness.

Finally, in this analysis of the origin of our belief in the signs of physiognomy, is the mere insistence that as a matter of fact there are definite relationships discoverable and formulable between typical features and typical characteristics o. personality. Beliefs of this dogmatic kind are most likely to be exploited by the professional counsellor, since they appear to the examinee to be unknown, mysterious, esoteric facts.

We must content ourselves on this point by insisting that the formulated facts of physiognomy are so unsupported, contradictory, and extravagant that the vocational psychologist cannot afford to trifle with them. General impression on the basis of the totality of an individual's appearance, bearing, and behavior we shall always tend to receive. Whether one judges more accurately by an analytic recording of each detail or by ignoring these in favor of his own more or less unanalyzed total impression has never been demonstrated. Under any circumstances one is likely to look about for such details as may lend support to the total impression. But it is quite unjustifiable—though perhaps commercially expedient—to pretend that the judgment is really based on the details selected.

30. THE APPLICATION BLANK AS A MEASURING DEVICE[1]

In order to arrive at some definite conclusions as to the questions asked on such blanks, the application blanks of twenty-five firms, each employing 1,000 or more people and representing a wide variety of industries, were analyzed as indicated in the following table.

In addition to the questions appearing in the table, two of the blanks contained numerous "self-analysis questions" and portions to be filled out by the employment supervisor, patterned after the forms advocated by a certain widely advertised system of selecting employees.

Questions in the table are arranged in order according to the number of times used.

Group I. Questions appearing on eleven or more of the twenty-five blanks:

1. Give your full name and address.
2. What is your age? (Or give the date of your birth.)
3. Date of this application.
4. Are you married?
5. Give the names and addresses of your former employers.
6. How long were you employed in each of your former positions?
7. What has been the nature and extent of your education?
8. What is your nationality?
9. For what position are you an applicant?
10. Why did you leave each of your former places of employment?
11. What persons (or how many persons) are dependent upon you for support?
12. What wages did you earn in each of your former positions?
13. What is your height and weight?
14. Give the names of references other than your former employers.
15. Have you been employed by this company before?
16. How many children have you?

Group II. Questions appearing on five to eleven of the blanks: [Omitted].

Group III. Questions appearing on two to five of the blanks: [Omitted].

Where the blanks could be checked up with the practice of the firms in hiring, there was ample evidence that answers to many of the questions on the more complicated blanks were not considered of much value. It is plain that a considerable number of the questions in the above table could be of no possible significance to most

[1] Adapted by permission from R. W. Kelly, "Hiring the Worker," in *Industrial Management*, LIII (1917), 1–16.

firms. One employment executive states that the following points are the only ones deemed essential in his department:

Name and address
Date of application
Date and place of birth
Date of immigration, if foreign born
Parentage
Languages spoken
Education
Whether married or single
Number in family
Wage contribution to family support
Record of previous employment

On the whole, the practice of the most successful employment departments would seem to indicate that such a thing as a "standard application blank" is not desirable. Very little has been accomplished, even by firms engaged in similar lines of work, by way of standardizing their record forms. Several large companies employ two or more different application blanks for employees engaged for entirely dissimilar occupations, as for office and factory help.

31. THE INTERVIEW AS A MEASURING DEVICE[1]

In a small concern it will be necessary for the employment manager to interview the majority of the applicants, and even in large establishments he may be called upon to select employees for certain positions or departments. There appears to be a tendency in the direction of selecting for employment managers men who have had extensive shop experience but very little education. The success of concerns that have tried the opposite method of choosing persons who have had a few years' contact with industry and a considerable amount of technical or professional education proves that the latter type of qualification gives much better results.

An examination of the work done by an interviewer in any large, well-organized service department reveals the need for a similar kind of preparation. Too much emphasis cannot be placed upon the necessity for having some practical experience in shop or factory work. This ought, if possible, to have been done under the urge of economic necessity; otherwise the point of view of the worker is

[1] Adapted by permission from R. W. Kelly, *Training Industrial Workers*, pp. 221, 224–25, 238–39. (The Ronald Press Company, 1920.)

never completely grasped. The interviewer who has spent a good many years at his trade comes by a kind of intuition to recognize those who are well qualified in his line. Like the prosperous business man without special training who makes no use of modern methods of accounting and investigation, he succeeds in spite of his limitations and may in the long run make very few serious blunders.

It is a mistake, however, to suppose that a knowledge of the job alone will enable the tradesman to select others for it. There are so many other factors which enter into his work as an interviewer and which help him to become proficient that general educational qualifications ought not to be neglected. He can acquire a sufficiently thorough knowledge of the positions to be filled in a relatively short time if he has the intelligence and training which fit him to collect and organize new information. The ideal qualifications for an interviewer may be summarized as follows:

1. Personal characteristics: patience; sympathetic attitude toward employees' personal problems; tact in dealing with others; accuracy in making records; alertness in following clues and drawing conclusions; originality in questioning difficult cases.
2. Experience in several different kinds and grades of work.
3. High-school preparation or the equivalent.
4. Intimate knowledge of the various tasks and working conditions in the firm or firms for which he hires. May be gained by:
   a) Working in various departments.
   b) Writing job specifications, making time studies, or doing other work on a part-time basis.
   c) Frequent visits to the plant during slack hours.
5. Intimate acquaintance with foremen, department heads, and minor executives.

32. SOME ASPECTS OF RATING SCALES[1]

Discrepancies are to be found in the marks of school teachers everywhere, the widest differences appearing in the judgments of any group of instructors who are asked to mark the papers of students in any subject. It may therefore be expected that much greater differences will appear in judging persons in such abstract or complex matters as "personality," "initiative," "co-operation," or "general value to the concern."

[1] Adapted by permission from R. W. Kelly, *Training Industrial Workers*, pp. 282–84. (The Ronald Press Company, 1920.)

Several methods suggest themselves by which this tendency can be overcome. The United States Army has made use of a method for rating officers which offers a fairly successful solution. Each rating officer makes out his own scale in the following manner. Five general headings have been selected under which the ratings are given. Under each of these heads the rating officer places the names of five officers of his acquaintance, arranging their names in order as shown in the accompanying scale. In rating subordinates, the officer then compares any given case with the men whom he has selected as his standards. Those who have used this scale claim that, because it calls attention separately and consecutively to each of several essential qualifications for an officer, it lessens the danger that judgments may be based on minor defects, with a corresponding disregard of important characteristics. Officers are especially asked to avoid the error of rating low in all characteristics a subordinate whom they hold in disapproval for any reason, or rating high in all characteristics a subordinate whom they admire for any special cause. To obtain the total rating for a subordinate, his ratings in the five separate qualities are added up. Anyone who equals the "highest" officer in the rating scale in all of the five characteristics thus receives a total of 100 points, and one who equals the "lowest" receives only 20 points.

The few experiments made by psychologists which can throw light on the qualities which ought to be listed in such a scale seem to indicate that there is some divergence in the ability to judge a trait in others according to whether or not one possesses it himself. Thus one's judgment of neatness, intelligence, humor, or refinement in others is likely to be reliable if one possesses these traits. Similarly, vulgarity, snobbishness, and conceit in the rating officer render his judgments of these characteristics in others quite unsatisfactory. In the same way it appears that there is a fairly close agreement as to judgments of efficiency, originality, or quickness, while there is likely to be little or no agreement among observers as to such traits of character as unselfishness, integrity, co-operativeness, cheerfulness, or kindliness.

The experience of educators has quite clearly demonstrated the futility of attempting to mark on a scale of more than ten divisions. Five divisions probably answer all practical purposes and are more certainly within attainable limits of accuracy.

THE RATING SCALE CARD USED BY THE UNITED STATES ARMY

I. *Physical Qualities:*		
Physique, bearing, neatness, voice, energy, endurance. Consider how he impresses his command in these respects.	Highest: Capt. John Doe	15
	High: Capt. H. Black	12
	Middle: Capt. R. White	9
	Low: Capt. W. Smith	6
	Lowest: Capt. E. Jones	3
II. *Intelligence:*		
Accuracy, ease in learning; ability to grasp quickly the point of view of commanding officer, to issue clear and intelligent orders, to estimate a new situation, and to arrive at a sensible decision in a crisis.	Highest: Capt. R. White	15
	High: Capt. B. Gray	12
	Middle: Capt. W. Smith	9
	Low: Capt. J. Brown	6
	Lowest: Capt. E. Jones	3
III. *Leadership:*		
Initiative, force, self-reliance, decisiveness, tact, ability to inspire men and to command their obedience, loyalty, and co-operation.	Highest: Capt. B. Gray	15
	High: Capt. John Doe	12
	Middle: Capt. R. White	9
	Low: Capt. W. Green	6
	Lowest: Capt. R. Blue	3
IV. *Personal Qualities:*		
Industry, dependability, loyalty; readiness to shoulder responsibility for his own acts; freedom from conceit and selfishness; readiness and ability to co-operate.	Highest: Capt. H. Black	15
	High: Capt. W. Smith	12
	Middle: Capt. R. White	9
	Low: Capt. A. Old	6
	Lowest: Capt. J. Young	3
V. *General Value to the Service:*		
Professional knowledge, skill, and experience; success as administrator and instructor; ability to get results.	Highest: Capt. R. Day	40
	High: Capt. H. Night	32
	Middle: Capt. R. Roe	24
	Low: Capt. A. Old	16
	Lowest: Capt. R. Blue	8

RATING SCALE FOR FOREMEN

I. *Trade Ability:* Compare nature and extent of trade experience; skill in using tools or machines; technical information; knowledge of related trades or processes.

II. *Production:* Compare ability to plan and get work out on schedule time; production costs; maintenance of department; quality and quantity of output.

III. *Administration:* Compare tact and fairness in dealing with employees; success in making occupational adjustments; discipline, *esprit de corps* of employees, special efforts to build up a stable working force; sanitary condition of department; accident record.

IV. *Training:* Compare willingness and ability to teach beginners; efforts to improve employees through instruction; co-operation with training department.

V. *Special Executive Qualifications:* Compare years of service; loyalty; knowledge of company's policies; co-operation with other departments and with higher executives; promptness and accuracy in making out reports; initiative; resourcefulness; self-control.

33. THE LABOR AUDIT[1]

The labor audit is a reasonably exhaustive and systematic statement and analysis of the facts and forces in an industrial organization which affect the relations between employees and management, and between employees and their work; followed by recommendations as to ways of making the organization more socially and humanly productive and solvent.

Managers are familiar today with various types of accurate current reports regarding different phases of factory activity. There are elaborate balance-of-stores records, elaborate production records, and analyses of selling conditions. But as yet most managements have not developed well-organized methods for recording or understanding the elements which go to make up what is in many businesses one of the largest classes of expense, namely, the labor costs.

[The subject-matter to be covered in the labor audit is indicated in section (*f*) of Selection 1. This material should be carefully reviewed with the query "What would be dealt with or audited on this topic" continually in mind.]

It will be helpful if the practical uses of the labor audit are summarily considered from four points of view—the uses to the general management, to the personnel manager, to the workers, and to the community. [The last two are omitted here.]

A. *Uses to the management.*—The audit is obviously useful to the management as a method of standard record and careful analysis; but other uses at once suggest themselves.

The material incorporated into individual sections, together with the recommendations, can profitably be made the topic for discussion

[1] Adapted by permission from Ordway Tead, *The Labor Audit*, pp. 7, 8, 42–45 (Federal Board of Vocational Education, 1920).

and for educational work in executives', foremen's, and workers' conferences. In a plant already well functionalized the different sections of the report would naturally be turned over for action to the executive charged with the responsibility for the function under consideration. But more than this is necessary. The audit has been made from the point of view of assessing the all-around human and social solvency of the organization or institution. And to the extent that this all-around point of view can be imparted to members of the executive staff by reading and discussing certain portions, if not all, of the audit, to that extent the broadest educational purposes will be served.

It will also be true, where a personnel department is in operation, that the audit can to a certain extent give the management a good estimate of its working efficiency. It can, in other words, be an audit of the personnel department. But it should be more than simply a statement. It should be definitely a working manual which, in the hands of all the personnel executives, can be used as suggestive of a point of view and of new methods.

Where new executives are being introduced, both into general executive work and into the personnel department, it is very convenient to have in fairly compact compass a statement that makes clear how the company's labor policy is operating. If a labor audit is turned over to such new executives to read they can be more quickly instructed in the policy and methods under which the company operates. As a document for the instruction for new executives the audit can have peculiarly significant values.

Again, the conscientious and enlightened employer, who is appreciative of his social responsibility, should be able to find in the audit an estimate of the human solvency of his business. He should be able to get a clear picture of the problems that remain for the plant to solve, of the immediate steps that he should take toward their solution, and of the larger problems he should have in mind to work on over a period of years.

B. *Uses to the personnel manager* —From the point of view of the personnel manager, the labor audit has certain values which are to be obtained in no other way: (1) It enables him to know all the elements of his problem. This knowledge of the all-around aspects of the situation with which he is dealing is indispensable for the forming of a right and adequate policy. (2) It enables him to frame and suggest a policy which is calculated to meet his problem in a

fundamental way. (3) It enables him to sell his policy to the organization with the maximum effectiveness. (4) It enables him to carry on his own administrative work with greater success because of his greater knowledge. And (5) it enables him to improve his policy and practice because of the estimate of its effectiveness he has secured in the audit.

And further use of a different sort should be mentioned. The personnel manager may, if he is casting about for a method of filing the flood of pamphlets and clippings on employment work which pour upon him, find that the topical arrangement of the audit with its subtopics affords a convenient method of filing.

See also p. 126. Another Statement of Functions.

E. Organization and Administration of the Personnel Department

We have reached the stage in our study where we may profitably canvass again the organization of the personnel department. What is the appropriate organization of this department? How should it be related to the rest of the business organization? What spirit should animate its director and his staff?

To these questions certain general answers may be made.

1. Administration of personnel in a given plant should be in terms of the conditions and problems facing that particular plant. A successful personnel administration in one line of activity might well be only moderately successful or even a complete failure in another line. An organization scheme admirably adapted to the administration of labor in the British Ministry of Munitions might well be quite unsuccessful if applied to an engineering firm or to a university. An administrative organization well fitted to the needs of a street-cleaning department might well make terrible failure if transplanted to a watch factory. There doubtless are certain general or common considerations applicable to all personnel work in the fields of individual and social psychology and in the economic analysis of the functioning structure of our industrial society, but the personnel manager who faces the task of organizing a personnel administration for a particular business unit must do so in terms of the special problems of that unit, recognizing of course the setting of these problems in our social structure as a whole.

2. Administration of personnel should be vastly more than a congeries of unco-ordinated, miscellaneous labor practices. It should be founded on principles; should be aimed at some definite goal. True, the personnel manager is such a recent arrival in the managerial family that his guiding principles are as yet none too well formulated. We have seen in another connection that the first hundred years following the industrial revolution was a period in which technology was emphasized. The human factor in industry, while by no means completely neglected, was certainly not carefully studied. Its careful study is, indeed, a matter of the present generation. Such a situation makes it all the more important that the manager of personnel visualize his goal as vividly as may be. He will administer his task as a coherent whole only as he sees it directed toward some such goal as "good output" and this in terms of the conditions precedent and prerequisite (see p. 128). Such a point of view gives personnel work a unifying thread—indeed it is the sadly needed backbone. The gain is not confined to the mere articulation of personnel work. This articulated agency has before it a straight road to travel; it no longer flounders about the fields. This means that the progress of personnel work in a business becomes measurable; achievements can be set over against expenditures in a somewhat definite way. Furthermore, since there is a road to travel, it becomes possible to tell when personnel work is "off the road." In other words, a sense of balance and proportion is attained. One can even picture a personnel manager who is not frantically absorbed in calculations of the waxing and waning of the American Federation of Labor; who is not gulled by the latest fad in employee representation, profit-sharing, or other mere mechanisms and devices; who has a vision reaching beyond the ephemeral happenings of today to solid, long-run achievements. But these things will not take place until miscellaneous labor practices have yielded to definite labor policies.

3. Administration of personnel must be in terms of the whole reach of business administration. The idea that a personnel manager can be fully successful when equipped with only a knowledge and appreciation of the worker's psychology has at present considerable vogue, but it will in the long run be rejected. The administration of personnel is of course the administration of human beings who reason, have prejudices, hear rumors, reflect on their circumstances, and are moved by their instincts and emotions. An expert knowledge of both individual and social psychology, and an able practitioner's

skill in both fields, would certainly be very helpful in the administration of personnel. But while all this is true, the personnel manager must be much more than "a glad hand artist"; much more than one who "has a sympathetic understanding of the laborer's attitude"; much more, even, than one well versed in the technique of modern "welfare work." More and more it will come to be realized that the administration of labor means the administration of labor *in production*, and that the thoroughly competent personnel manager must be conversant with at least the broad principles underlying the administration of the other phases of the business in which he is engaged. This is, after all, only another way of saying that business problems are highly interdependent. Because of this interdependence, the personnel manager cannot administer his own field of activity satisfactorily unless he can meet on approximately equal terms the production manager, the sales manager, the purchasing agent, the advertising manager, the treasurer, the cost accountant, and other business functionaries in any discussion or any plan of action looking toward the growth and prosperity of the business as a whole.

4. Administration of personnel must be in terms of the functioning structure of all industrial society and of its evolution as well. This seems a large statement to make of the work of a personnel manager in a given business plant. It is none the less true. The workers of his plant come to their tasks with certain mental outlooks both upon the task itself and upon their position in industrial society. These outlooks are of course derived from their immediate social environment in part, and they are derived in part from the environments of preceding periods. It would be a foolish personnel manager who would attempt to administer labor activities without recognizing this situation. What is true of the psychology of the worker is also true of that of the personnel manager. His attitude, and the instrumentalities which he will use are the results of environment, both present and past. It will be conducive to sanity of judgment on his part if he realizes this fact.

Social attitudes, furthermore, are reflected in institutions and give point to practices. It would be a strange personnel manager who could be indifferent to the problems of collective bargaining, industrial peace, social insurance or unionism. Of course, such matters cannot be understood except in terms of the evolution of our economic organization.

Perhaps the foregoing may be reduced to a brief statement of the chronological steps which might wisely be taken by a person called upon to take charge of personnel administration of an industrial plant. Such a statement might well run as follows:

1. He must first visualize his objective—that of getting men to work together effectively.

2. He must formulate the conditions precedent to arriving at that objective, as for example, the five conditions mentioned on page 128.

3. He must decide upon the technical devices, ranging from ventilation to methods of wage payment, which will assist in bringing these conditions into being.

4. He must (*a*) formulate and (*b*) set up his organizations, doing so, not merely in terms of his own work, but also in terms of the work of the other lieutenants of the business.

5. He must administer his organization with vision, with understanding of the character of his contribution to the great social task of getting men to work together effectively.

PROBLEMS

1. Even in the larger industries which have now decided that employment requires the special direction of an employment department, its development is of recent growth. Why?
2. "Industry does not affect wage-earners merely as persons possessing labor which they dispose of on a basis of time, skill, and energy. For most men and women, the conditions which surround Industry, and the output of Industry, represent all that is possible for them in the way of health, happiness, and life itself. Both as consumers and producers they are affected by all that affects production." Has this always been true? If so, why is it particularly emphasized now?
3. "In the first place, an employment office alone can deal with the task of scientifically organizing the source of supply of help." Why? What methods and devices could it use in accomplishing this task?
4. "Employment is essentially a plant and not a departmental problem." Is this always true? Why, or why not?
5. "Unquestionably the foreman must be relieved of the duty of hiring and firing men if the human factor of industry is to receive due attention." Why?
6. "In some instances employment managers report that they send men to the foremen for the final judgment as to their fitness." Is this desirable?

7. "Every employee is given to understand that he may come freely to the employment department and state his grievances, if he has any, and that every case of inefficiency, discontent, disharmony, and misunderstanding will be decided only upon the evidence and always with a desire to be just." "It is likely to be demoralizing to the discipline of the factory to remove the power of immediate and summary discharge from the department heads." With which quotation do you agree?
8. The personnel manager should have before him as an employment aid a complete organization chart of the business he would serve supplemented by data concerning each division of the work." Why? What Supplementary data are desirable? List the uses which might be made of such a chart by the personnel manager.
9. "Where, moreover, enough people are employed to make employment a real problem, it is a problem as important as operating itself, and requiring as much, if not more, ability." Do you agree?
10. "In the first place when a man is made an employment manager for a corporation he should have a distinct understanding with his superior officers as to just what his responsibilities are to be and just how far he is expected to be held responsible for the character of the people he employs." Is this any more important in his case than in that of any other manager? Why or why not?
11. "Complete power to determine the rates of pay is not often granted, but the employment manager is frequently given the right to determine beginning wage and rate of increase." Should complete power be granted? Why or why not? Who should have this power?
12. "Before it is possible to estimate what wages can be paid it is necessary to know costs in every department of a business and in detail." What does this imply concerning the position and qualifications of the man who is to determine the wages? Do you agree with the quotation?
13. It is generally said that class consciousness has developed quite slowly in the United States. Can you give any reasons why this would be true? If true, is it of interest to the personnel manager?
14. It is well for the director of industrial relations to have an intimate knowledge of the manufacturing processes of his plant and of the system of control used in those processes. Why is this important?
15. It is important for the director of industrial relations to know the sequence of operations in his plant; to be able to judge how efficiently the manufacturing processes are being conducted. Why?
16. The director of industrial relations will be wise if he keeps in close touch with the sales organization and is thoroughly conversant with its problems. Why?
17. The director of industrial relations should have a thorough knowledge of accounting as an instrument of control. Why?

18. The director of industrial relations ought to have a good appreciation of the general principles of business finance and ought to be conversant with the financial policy of his particular firm. Why?
19. It is highly important that the director of industrial relations should be well grounded in the general principles of business law. Why?
20. Other things being equal, the director of industrial relations who has a good knowledge of organization policies and methods is the one who is likely to succeed. Why?
21. Which is the better organization for a large manufacturing and selling business: (*a*) a vice-president in charge of all personnel, or (*b*) several personnel managers, one operating under the works manager, another under the sales manager, and another under the office manager?

34. THE CASE FOR A CENTRALIZED PERSONNEL DEPARTMENT[1]

The failure of managements to perceive the conflict between their methods of handling men and their self-interest was due to their failure to give careful attention to the subject of labor administration, which in turn was due to the concentration of responsibility for formulating and executing labor policies in executives who also were in charge of manufacturing operations and responsible for output and costs. The remedy, therefore, would appear to be the addition of a general officer of high rank whose sole responsibility is the formulation and the supervision of the execution of the labor policies of the enterprise. The principal reasons for the addition of such a specialist are:

1. Adequate attention is not likely to be given to problems of labor management when their administration is in charge of the factory manager or production manager because the problems of labor administration cannot ordinarily compete with the problems of production for the attention and interest of the executive. In the first place, it is a peculiarity of the problems of production that they are problems of immediate importance which cannot be postponed. Production schedules must be arranged and maintained. Unforeseen impediments, delays, and problems constantly develop which require immediate attention. The problems of handling men, on the other hand, do not press for such immediate consideration. They can be postponed or neglected without usually producing serious

[1] Adapted by permission from S. H. Slichter, "The Management of Labor," *Journal of Political Economy*, XXVII (1919), 816–32.

results—immediately. In the second place, defective production arrangements cannot escape notice. They advertise themselves most effectively by a falling-off in output, failure to maintain schedules, and a rise in costs. Defects in the administration of labor, however, have no such effective means of advertising themselves, for as a rule they produce no immediate, sharp, clearly defined effects. Unless someone is carefully scrutinizing methods of labor administration, important defects may exist indefinitely without their presence being suspected. Finally, executives prefer to concentrate their attention upon the improvement of manufacturing processes because such improvements produce more direct, immediate, certain, and definitely recognizable increases in output or reduction in costs for which the executives receive credit. Improvements in methods of handling men produce no such direct, certain, immediate, and easily distinguishable effects.

2. The preoccupation in the problems of manufacturing processes, technology, and production schedules to the exclusion of adequate attention to labor administration, which occurs when responsibility for the conduct of manufacturing and of labor administration is concentrated in the same official, severely hampers the management in obtaining the good will and loyalty of the workers.

3. A specialist labor administrator is desirable to give stronger representation to the long-run point of view in handling labor. The factory manager and the divisional and departmental heads who are responsible for maintaining production schedules each day and for costs from week to week or month to month are interested primarily in more efficiency *immediately*, rather than a year or two hence. They are therefore under a strong temptation to sacrifice efficiency in the long run for immediate efficiency.

The labor administrator is better able to see the long-run connection between the methods of handling labor and the efficiency of the force than is the executive who is struggling each day to get out the production scheduled for that day or to beat his last week's or last month's cost record. More especially is the labor administrator able to do this since these short-sighted policies all hamper him in the maintenance of cordial industrial relations. By representing the long-run as opposed to the short-run point of view the labor administrator tends to be a protector of a valuable capital asset—the good will of the workers—against tendencies to dissipate it for immediate but temporary benefits.

4. Specialization of the management of labor is needed to obtain in the formulation of policies more adequate representation of the interest of the enterprise in good industrial relations.

The interest of an enterprise is not a simple thing. It is a complex thing, a balance and compromise of particular and partially conflicting interests. The judgment of each executive in regard to the interests of an enterprise is affected by the particular interest of the enterprise which it is his function to promote. Sales manager, purchasing agent, auditor, advertising manager, comptroller, factory manager, production manager, chief engineer, each tends to have a more or less exaggerated idea of the importance of the particular interests of the enterprise which are intrusted to him. The creation of a specialist labor administrator imposes a wholesome check upon the undue sacrifice of the interest of the enterprise in good industrial relations to its interest in lower costs and more output. The labor administrator is, of course, as likely to overestimate the importance of good relations with labor as the factory manager and the production manager are to overestimate the importance of output and costs. He will be counteracted in his extremity by the counsel of the factory and production managers, just as he counteracts the extremities of the factory and the production managers.

5. The maintenance of high standards of practice in handling men requires that the practices of foremen and other minor executives in handling men be under the scrutiny of a high executive who gives these matters his careful attention.

This is simply a specific application of a well-accepted principle of management. By no miracle will high standards of practice in labor administration create themselves. They will be created only by being taught and their observance insisted upon. The minor executives who handle labor, the employment manager, safety engineer, plant physician, welfare manager, head of the instruction department, foremen and gang bosses, will be assiduous, zealous, and painstaking in their work in the degree that they are inspired and stimulated to observe high standards and held strictly accountable for the methods they use and the results they produce.

6. Specialization of the administration of labor is needed to enable the management of labor to be conducted with a keen realization of the workmen's point of view and an accurate understanding of their psychology. Not only are non-specialist executives, with their minds concentrated on manufacturing processes, output, and

costs rather than on the men, and coming into close contact with the men but little, woefully ignorant of the minds of the men, their psychology, and their point of view, and also often little interested in informing themselves of these matters, but the nature of their work builds up in their minds a point of view so different from and even opposed to that of the workmen that even when they seek to understand the point of view of their men they are frequently unable to do so.

7. Specialization of the management of labor is needed to reduce the prejudices on the part of the management in dealing with questions of labor policy. Employers have been severely handicapped in handling labor by fixed ideas which have blinded them to their interests and caused them to take stands which gained them nothing but the ill will of their men. Numerous examples of such prejudices can be cited. The philosophy of the drive policy, that the only way to get much out of labor was to "treat it rough," is an example. A corollary of this, that attempts to obtain the good will and cooperation of labor by liberal treatment are futile, since labor will simply take advantage of liberal treatment rather than respond to it, is another example. The well-nigh universal rule that in a dispute between a workman and foreman the foreman must be upheld, right or wrong, in order to maintain discipline has caused much friction and discontent.

Specialization of the management of labor is of course no guaranty that the administration of labor will be controlled by carefully determined self-interest, but the specialist administrator is less likely than a non-specialist to be guided by traditional attitudes. Non-specialists lacking time and inclination to investigate problems of labor policy naturally fall back on traditional points of view. The specialist has both the time and the interest to investigate, and being charged with the specific function of maintaining high standards of labor administration, feels a peculiar sense of responsibility for the methods he uses and the policies he pursues. Study of the problems of labor administration constantly reveals to him their complexity and the danger of being guided by dogmatic conclusions.

8. Success in getting problems solved depends largely upon the energy and persistence with which they are attacked. Solutions of extremely difficult problems are obtained as a rule only by someone's demanding that a solution be found in spite of the apparent impossibility, insisting in the face of seemingly insurmountable obstacles

that there must be a way of overcoming the difficulties, and causing the problem to be studied until a solution is found. There can be no reliance that the exceptionally difficult problems of labor administration will be attacked in this manner as long as the executive responsible for labor administration is a non-specialist whose interest in labor administration is quite secondary. The preoccupation of the non-specialist with other problems causes him readily to accept the exceptionally difficult problems of labor administration as unsolvable, instead of insisting more emphatically than ever that they must be solved.

9. Efficient administration of labor requires possession of specialized knowledge and command of a specialized technique. The handling of men is not, as is sometimes supposed, simply a matter of personality and of ability to understand human nature. Many problems in labor administration require, not merely sound intuition or instinct in dealing with men, but ability to solve problems of a more or less technical nature. This renders desirable a knowledge of practices and policies which have been successful in solving the same problems elsewhere. The fund of experience on the various phases of labor administration is so large and growing so rapidly that only a specialist can hope to be familiar with it.

The subordinate specialists in charge of specific phases of labor administration cannot all be expected to be of strictly first-class executive ability. Though suitable for *executing* policies, they may not be suitable for *determining* fundamental labor policies. They are likely to lack the requisite shrewdness of judgment and boldness and originality of imagination, to be too timid in their conceptions of what the labor administration can hope to accomplish and therefore of what it should endeavor to accomplish, and to be dominated by tradition and prejudices. In the field of labor administration particularly, where traditional prejudices are strong and firmly established, is someone with bold and original imagination and willingness to break with the past needed to formulate policies.

10. Although the essential thing in winning the confidence and co-operation of a force is a liberal labor policy, the personality and character of the executive who handles labor is an important factor. The handling of grievances, one of the most important and most delicate tasks of the labor administrator, illustrates the need in the labor administrator for highly specialized qualities of personality. Among these are insight into other men's points of view, ability to

put one's self in another's place, even in an opponent's place, ability to win the confidence of other men, particularly the complainant, who is likely to regard all representatives of the management as prejudiced against him and hostile to him and as intending to deceive him rather than to give him fair treatment, ability to draw frank statements from timid or hostile witnesses, and, most difficult of all, ability to convey to the complainant the point of view of the management, to make him see the management's side, and to convince a complainant who is in the wrong that he is wrong and that his complaint is not being arbitrarily decided when it is decided against him.

11. Specialization of labor administration is needed to bring into the highest councils of the management more thorough knowledge of and stronger interest in the more fundamental though less immediately practical aspects of the labor problem. The typical manager of a non-union enterprise is inadequately informed in regard to the labor movement, its practices, policies, ambitions, philosophies, strength, prospects, tendencies of change within it, and the reasons lying behind these specific phases of the movement. He is hampered in obtaining information by publications of employers' and manufacturers' associations and speeches of their officers and attorneys, which too often foster intolerance and prejudice rather than spread information.

12. Specialization of management of labor means in time the creation of a body of professional labor administrators. This means the creation of a professional spirit, professional ideals, and professional standards of conduct. This professional spirit and these professional standards may be expected to exert a liberalizing influence upon the standards of labor administration.

See also p. 118. Organization of the Personnel Department.
p. 124. Functions of the Personnel Department.
p. 126. Another Statement of Functions.

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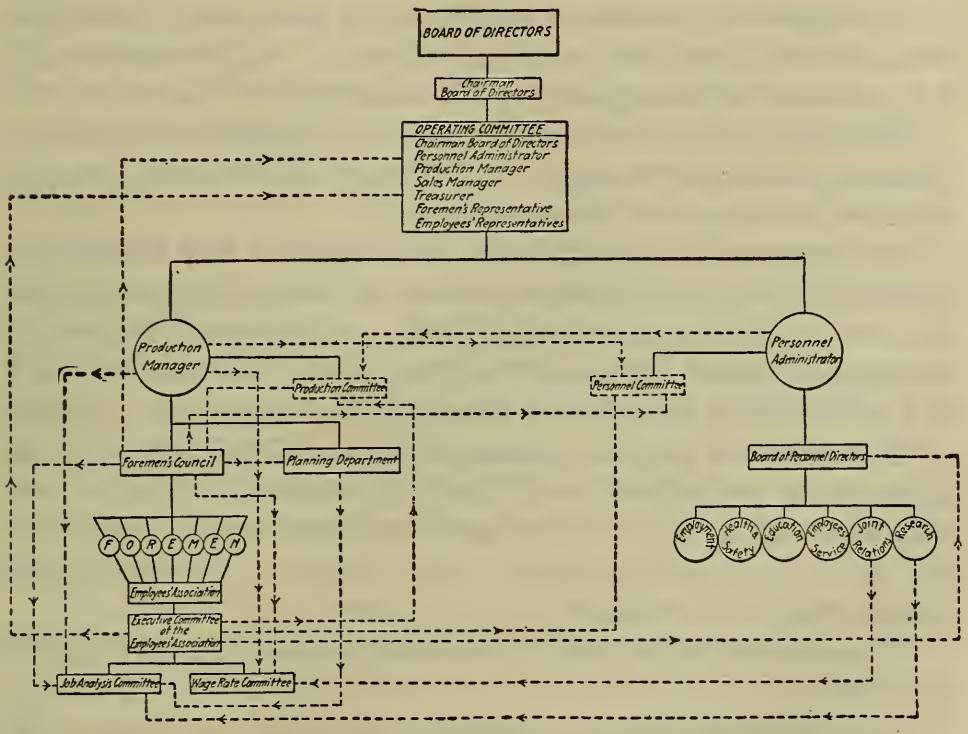
35. THE PLACE OF THE PERSONNEL DEPARTMENT IN THE BUSINESS ORGANIZATION[1]

It is the purpose of this reading to consider how policy is best adopted, transmitted, and put into effect. Especially are we con-

[1] Adapted by permission from Ordway Tead and H. C. Metcalf, *Personnel Administration*, pp. 374-92. (McGraw-Hill Book Company, Inc. 1920.)

cerned to see how personnel policy or the policies of other departments where they are affected with a human interest, are "put across." The problem is to find effective ways of interdepartmental co-ordination; to see how the ideas of staff experts can be made to function in the line departments; to see how the several staff experts can work in harmony and not at cross purposes—can work with prior understanding of a common aim.

FUNCTIONAL CHART SHOWING CO-ORDINATION OF PERSONNEL AND PRODUCTION ADMINISTRATION



The principle underlying sound co-ordination.—Every special interest directly affected by decisions concerning the operation of any enterprise or function should be a party to the making of those decisions. The principle is immensely relevant to this discussion because it seems to us fundamentally true that any policy which is adopted is more likely to be a reasonable and wise one if those whom it affects help to shape it; that the transmission of policy to the affected parties takes place most naturally when those parties or their delegates are present when the policy is adopted, know its implications and the reasons for its adoption, and hence can interpret it to their fellows; that the policy when so adopted, so transmitted and

interpreted, has a better chance of intelligent, willing and thorough execution, than if it is handed down as a fiat from the management.

The determination of general policy.—We shall assume that the president of the corporation is at the same time a member ex-officio of the board of directors and the executive of the factory organization. Immediately associated with him there will be four major, staff executives—the personnel manager, production manager, sales manager and financial executive. For the determination of general operating policy, this group of five would constitute the nucleus to which others would be added, of an Operating Committee.

This operating committee would meet at least weekly; indeed in some plants it has a daily morning conference. And its membership, if it conforms to our suggestions, will be as follows:

The Chief Executive, the Production Manager, the Personnel Manager, the Sales Manager, the Treasurer, the Foremen's Representative, the Workers' Representatives.

The personnel committee.—If it is understood that beyond the determination of broad policies the work of the operating committee does not go, there is need for a body in each of the staff branches of management which will decide how their policy shall be carried out and will acquaint the affected groups with proposed new methods.

Policies which relate to personnel should, we propose, go for decision about methods of execution and delegation of duties to a Personnel Committee. The personnel committee is primarily advisory to the personnel manager. The executive responsibility lies clearly with this functionary.

The composition of such a personnel committee might well be as follows:

The Personnel Manager (chairman), the Production Manager, the Assistant Personnel Manager, the Foreman's Representative, the Workers' Representatives.

Board of personnel directors.—Within each staff department lies a further field for common understanding and agreement upon policy and procedure; and in the personnel department the need for a united stand and a human point of view are obvious. For this reason, it has been found useful in most personnel departments comprising more than two or three workers to have a definite organization within the department. This assures regular conference between the personnel chief and his executives on employment, health, safety, training, research, service and joint relations, and secures the benefit of the interchange of technical ideas and of the

wholesome expert criticism of department colleagues. We shall refer to this group as the Board of Personnel Directors.

Determination of production policies.—Because production policies so often affect the working force directly, there are sound reasons for organizing their adoption and transmission in a manner similar to that just considered in relation to the personnel department. This would mean the creation of a committee, called perhaps the Production Committee, composed as follows:

The Production Manager (chairman), the Personnel Manager, the Assistant Production Manager, the Foremen's Representative, the Workers' Representatives. And where special problems were up, such other executives as the head of the planning department, the chief engineer, the chief chemist, etc., would be called in.

It is the function of this committee to advise with the production manager about methods of putting new production policies into effect —the executive power remaining, of course, with the production head.

Determination of sales policy.—In the form of plant organization which this chapter assumes, general sales policies would be decided in the operating committee. How drastic a proposal this is, may not be at first appreciated; for many firms are still unconscious of the extent to which they allow the sales organization to dictate to the rest of the management. If the salesman can get the orders, it has formerly been true that the shop will be turned on end if necessary to fill them; if he cannot get them, the rest of the organization sits by paralyzed.

The point of view about the selling policy which is increasingly recognized as sound is at almost the other extreme from this. The sales force is being called upon to sell what the production force can make. And this certainly comes nearer to a sensible relationship of sales to production than the arrangement now so frequently met.

It is probably true, at least for the present, that all the personnel manager can do to oppose a sales policy which spells irregular work, rush orders, overtime work, small-lot orders, etc., is to use his influence and knowledge in the operating committee. But this will be a valuable educational service and he will soon find support for his advocacy of regularized production from the production manager, foremen, and workers. For it will soon be obvious to these groups that on all such matters as changes in styles and specifications, decisions about amounts of finished goods to be kept on hand, quality and amount of goods that can be delivered on certain dates, these groups should be consulted. The adoption of improved sales

methods will then devolve upon the selling staff; and they will find, as our next chapter indicates, an appreciable body of suggestive experience already at hand to help in devising a sales policy which regularizes orders and demand.

Determination of financial policies.—Obviously policies which affect the balance sheet are likely to work back and influence the pay-roll—and perhaps other elements in the personnel procedure.

Companies should realize how intimately connected with personnel matters their financial problems are. And even beyond that, managements should now consider the benefits in increased knowledge, confidence and sense of security, which a consideration of financial policy with employees is tending to bring.

Each day the newspapers carry financial stories and advertisements of the profit-making ability of this or that stock. The workers, or the workers' representatives, see these stories. And having no other knowledge on which to base any more exact opinion, they necessarily take them at their face value, draw their own conclusions and act accordingly. Illustrations are plentifully at hand to show that where managements have taken workers fully, freely and sincerely into their confidence on financial matters the results have been mutually satisfactory.

Charts of co-ordination.—Organization charts can serve a useful purpose in keeping everyone's thinking straight about the correlation of functions. But confusion will be avoided if it is recognized that charts are of three distinct types to convey three different kinds of information. And until all three are understood, the whole story of the distribution of executive work and authority is not apparent.

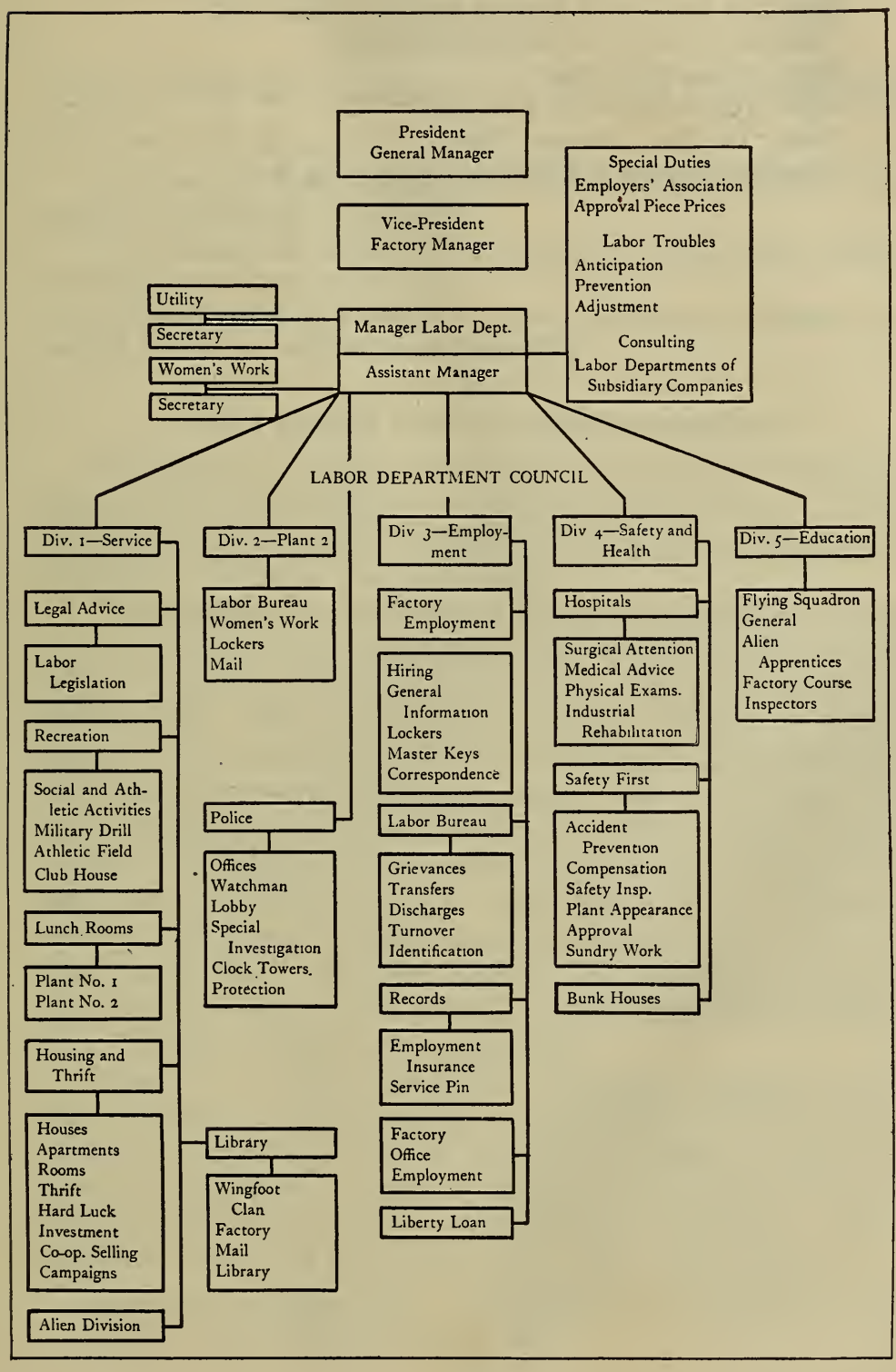
There is, first, the *authority* chart, which shows the line of authority, of policy determination and execution.

There is, second, the chart of *funciions*, which shows what functions each department is supposed to perform.

And, third, there is the *personnel* chart, which shows how the several functions are distributed among the executives. Usually, the first chart can be combined with the third to show the line of authority in terms of those who exercise it.

To help make graphic the proposals of this chapter, we have included in a chart our general conception of the interrelation of the different functional groups of the personnel and production departments. To keep the chart as simple as possible we have not shown how these two departments might be co-ordinated with sales and finance; nor have we included any relationship to outside bodies such as would be entailed if a collective bargain existed with a labor union.

36. ORGANIZATION CHART OF PERSONNEL WORK IN ONE INDUSTRIAL PLANT



REFERENCES FOR FURTHER STUDY

Jones, *The Administration of Industrial Enterprises*, chaps. x–xv.
Shaw, *An Approach to Business Problems*, chaps. vi, xii.
Tead and Metcalf, *Personnel Administration.*
Kelly, *Hiring the Worker.*
Allen, *The Instructor, the Man and the Job.*
Webb, *The Works Manager Today.*
Marshall, *Readings in Industrial Society*, chap. ix.

CHAPTER IV

THE ADMINISTRATION OF MARKET PROBLEMS

Purposes of this chapter:

1. To see the work of marketing functionaries as one phase of the modern co-operation of specialists.

2. To secure an elementary knowledge of present-day market functions and market structures.

3. To get some appreciation of the administrative problems and control devices in purchasing and in selling.

A. The Knitting Together of Modern Specialists[1]

Let us begin by getting a view of the part played by the purchasing agent and the sales manager in our modern economic society. Briefly stated, their function is that of aiding in knitting together our modern specialists. Let us see what this means.

"Specialization is fundamental in economic organization, because it is the means by which man increases the return to a given amount of work," says the English economist Clay. This is the nub of the whole matter. Man in his active adaptation struggle is always eager for devices which will increase productivity, and probably none has been more fruitful than specialization. We know already the prime reasons why it increases productivity. They are well stated by Clay: "It brings about this result in two ways, by subdivision of tasks and by repetition of tasks. Subdivision results in operations easier in themselves, repetition enables operations to be performed with greater ease." We know also from our historical study that there must be a market wide enough to absorb the increased productivity before it is worth while to specialize.

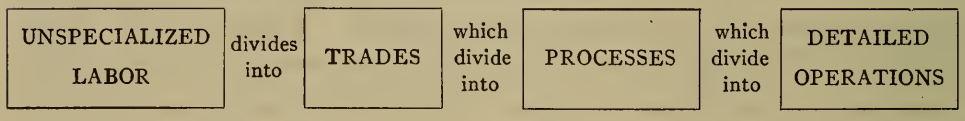
1. *Ours is a society of specialists.*—Historically speaking, one of the earliest forms or manifestations of specialization was the differentiation of occupations. Even in the mediaeval manor, where nearly everyone engaged at one time or another in practically all of the manorial tasks, there was some specialization of this kind. There was pretty certain to be a priest and a miller, and quite likely a

[1] Adapted by permission from L. C. Marshall and L. S. Lyon, *Our Economic Organization.* (The Macmillan Company, 1921.)

blacksmith or a carpenter. With the rise of towns there developed clothmakers, barbers, millers, innkeepers, merchants, shipwrights, pinmakers, tanners, and coopers, to mention only a few of them.

Occupations grow or wane, rise or disappear, in keeping with men's wants and with changing economic organization. As time went on, occupations became more and more numerous, more and more specialized. With the coming in of the factory system some of them rose to the position of great industries. For example, the mediaeval shoemaker has been almost supplanted by the modern shoe-manufacturing industry; the mediaeval cooper by the great cooperage plants. Today we see our social resources, land, labor, capital, and acquired knowledge, divided up or apportioned among great industries, which are so numerous that a mere list of them would cover pages. It would be tiresome to enumerate them. Instead, let us look at the diagrammatic classification of the specialized productive enterprises of a modern community, as set forth in the early pages of this book (see p. 2). It could be subdivided much further, but as it stands it is very useful in giving us a bird's-eye view of the specialized enterprises of today.

The story of the differentiation or specialization which has occurred since the days of the manor can be told in another way, this time emphasizing, not our groupings into lines of industry, but the differentiation of the tasks of the worker. Put in the form of a diagram it would run this way:



Let us begin again with the unspecialized inhabitant of the manor—unspecialized, that is, except for the priest, the miller, the blacksmith, and the carpenter. The next stage is the differentiation into trades or crafts, some of which have been mentioned above. In some cases the market is not wide enough and the demand for the product not great enough to justify any further differentiation; for example, we have even today in rural districts the all-around carpenter; in the country town or the suburb we have the physician with a general practice, or the lawyer who handles all kinds of cases.

In other cases, however, a wide market existed and trades became differentiated into processes. We know how the expanding market

led under the domestic system to the differentiation of the old cloth-maker into the spinner, the weaver, the dyer, the fuller, the shearer, and others. The smith became differentiated into the goldsmith, the silversmith, and the blacksmith. Abundant examples of the same process exist in our society today. In our larger cities general medical practice has frequently been broken up into the work of the eye specialist, the ear specialist, the heart specialist, and others. The lawyer has become the corporation lawyer, the patent lawyer, and the claims attorney; the all-round machinist has differentiated into quite a range of "specialists."

The case of the machinist is on the very border of the fourth stage of development, when processes become split up into their small constituent operations. This stage is not often reached in the realm of professional services, but it is the typical state of affairs in machine industry under the factory system. In the large plants of the meat-packing industries, for instance, where more than 1,000 cattle a day are killed, each of several hundred butchers, helpers, and laborers performs some one specialized detailed operation in the course of turning the live animal into dressed meat.

The differentiation into enterprises and the differentiation of trades, processes, and operations have been discussed separately, but they are not separated in our actual want-gratifying activities. Some idea of how they are interwoven and intertangled in ordinary business life may be secured if you will think back over the preliminary steps involved in your making such a simple thing as a wooden footstool in a manual-training class. Take, first of all, the wood which you work up. Let us go no further back than the cutting down of a tree in a forest. This is done by one specialist. Later the tree is sawed into rough boards at a sawmill by another group of specialists. It is then bought by a wholesale lumber dealer; transported by another group of specialists; sold to a retail dealer who has a mill for planing it and working it up into more appropriate shapes; sold by the retail dealer to your school; transported through the streets by a draying concern. The material has thus passed *successively* through the hands of a range or series of specialists who can be classified from one point of view in terms of the producing industries of society, such as lumbering, transporting, and merchandising, and can be classified from another point of view in terms of trades or processes (such as teamster, brakeman, telegrapher), all of whom were engaged

in preparing wood for your use. A similar series, of course, exists for each tool you use, for nails, glue, or other material.

But this is only the beginning. Every one of the specialists in your original series or succession reaches back into one or more other series. Take, for example, the sawmill which sawed out your board. It is the end or culmination of the work of several series of specialists reaching back into the forest, the ore mine, and the cattle industry. It might well happen that the specialist in the ore mine or in the cattle industry who took part in the series culminating in the sawmill also took part in the series culminating in your hammer, or the leather you used in upholstering the stool. This illustration is typical. It shows how our specialization runs in great ranges or series which criss-cross one another in bewildering complexity. We must try to find out how order can exist in such a seeming chaos; how it can be that a hammer is at hand when you need it; that nails are procurable when you need them; that every specialist in every series is, speaking generally, able to proceed in his work without interruption or delay.

In these ranges or series we find certain specialists who are called functional middlemen. What this means can be better seen if we use historical perspective.

When we think of the mediaeval merchant who sold either in England or abroad, there comes to our minds an unspecialized merchant who fared forth with his pack, his boatload, or his shipload of goods, seeking the people to whom he could sell at a profit. He performed a wide range of tasks. He displayed and advertised the goods to the buyers, he furnished the funds for financing his business, he collected the payments, he acted as policeman or soldier to protect himself and his goods, he bore the risks of fire, theft, accident, and loss. The variety of his functions was certainly great.

As new markets were opened up, both at home and abroad, and the volume of English trade grew, enterprising men began to see that a profit could be made by carrying on certain lines of business which would be an aid to the merchants by relieving them, of course for a payment, of some of their many tasks. These enterprising men specialized in certain functions. The specialization of function which began then has continued down to our own times. The manner in which the functions performed in trade by the mediaeval merchant have split up among a group of specialists can be shown by a diagram.

The mediaeval merchant had to perform the functions of	Transporting	These functions are now performed by specialized middlemen	Railroads, ship lines, etc.
	Protecting		The state police, Army, Navy, etc.
	Insuring		Insurance companies, etc.
	Storing		Warehousemen
	Advertising		Advertising agencies, newspapers, and other media
	Selling		Special salesmen
	Gathering information		Trade papers, government agencies, etc.
	Financing, etc.		Financial institutions, etc.

We specialize, not only by industries, by processes and operations, and in series; we specialize also by localities. As everyone knows, in the United States oranges, lemons, and other citrus fruits are grown mainly in Florida and California. Minnesota specializes in wheat. Iowa and Illinois specialize in corn-raising. Cotton is raised on the fertile land and in the warm climate of the South. Northern Michigan and northern Minnesota have localities which specialize in the production of copper ore. The states of the West and Southwest are specialists in producing livestock. Cotton manufacturing is almost confined to three districts, New England, the Middle States, and the South.

Since the modern consumer, himself a specialist, actually does succeed in gratifying wants and since the modern producing specialists actually are able to carry on their productive activities, it is clear that the specialists of modern society, whether they be individuals, trades, business units, or localities, are correlated into a working system; that they *co-operate* with one another in production and in want-gratification.

2. *Modern specialists are knitted together "by authority" and "through exchange."*—For purposes of this study there are two main kinds of co-operation: co-operation *by authority*, and co-operation *through exchange*, both of which play important parts in our economic organization. The members of a football team have their specialized

tasks which they perform, when practicing, under the authoritative direction of the coach. During their games, they are under the authority of their captain. A communistic society, where a central committee apportioned us to various tasks and directed the gratification of our wants, would be another illustration of the co-operation of specialists by authority. We must not suppose that such an illustration is purely hypothetical. In our own country there have been dozens of communistic colonies or societies, such as the Shakers, the Oneida Community, the Harmonists, the Amana Society, Brook Farm, and Icaria, which have been operated on this basis. Some have been short-lived, others long-lived; many have been abandoned, some are still in existence.

One thing is noticeable in all cases of co-operation by authority. It is likely to be a quite definite process, with everyone aware of the scheme of organization. Co-operation through exchange, on the other hand, is not likely to seem so highly organized; the parties concerned are not always fully aware of what is going on. In our discussion of the localization of industries we saw a case of co-operation through exchange. It was very effective co-operation which was sometimes world-wide in scope, but probably very few of the specialists concerned realized that they were co-operating. They probably thought, if they concerned themselves about it at all, that they were simply selling their goods.

So they were; but though they were simply selling goods in the market, these goods moved to points of need (some consumer or some producing unit) as truly as if the process had been ordered by someone in authority. Those participating in the market transactions were as truly agencies of co-operation as was the central committee of our hypothetical communistic society. The essence of the whole matter is this: Specialists can produce more than non-specialists; through exchange or by authority (and it is mainly through exchange in our society) the enlarged product becomes available for all. It is mainly exchange which bridges the gap created by specialization between producer and consumer· between trade and trade; between firm and firm. Its goal is the making of the product of each available for all.

The co-operation—the correlation of specialists—which occurs *within* a business unit may fairly be described as co-operation by authority. We have seen that the central figure in this process is the business manager. We have also seen that he and his sub-

ordinates are responsible for the relations of that unit with the rest of the world, but it has perhaps not been made entirely clear through what channels its co-operation with the rest of the world is carried on. In the main, it is through channels of exchange. The rest of the world furnishes (sells) it the materials and equipment for production. It furnishes to the world (sells) its product—shoes, let us say.

It is quite clear that the specialization of men and proc esses which we have been studying is a complete antithesis of self-sufficien cy in want gratification. It can occur only in a group or society; only when specialists can be "organized" so that the results of the specialized efforts of each can be made available for all. Our study would not be complete without a recognition of the part played by social control in this process. We have given credit, as was due them, to the manager of the business unit, to the middleman, and to the functional middleman, but we must keep in mind that all of them performed their tasks according to "rules of the game." Habit, custom, tradition, public opinion, codes of business ethics, all play their part. The state, not only by direct participation as in the case of the post-office, but also by such regulative activities as the formulation of rules of business law, the provision of a monetary system, the control of transportation facilities in the interests of all, the supervision of conditions of labor even to the extent of fixing minimum wages, to mention only a few of literally hundreds of cases, furnishes an essential part of the business environment.

3. *The term market here used in a narrow sense.*—No one should be misled by the predominance in the foregoing paragraphs of illustrations drawn from the marketing of ordinary goods. "The market" is as truly a means of the co-ordination of specialists when laborers are hired, land is rented, money is borrowed, corporation stock is issued, or hotel lodgings secured as it is when shoes are sold by the manufacturer. "The market" is a complex social institution, based in our society on the right of private property, which is used in multitudinous forms to aid in bringing about the co-operation of specialists through exchange. In strict logic, the manager who hires labor or who borrows capital, is in relationship to "the market" as truly as is one who sells books. *It is accordingly a concession to popular usage of terms when, in this chapter, we limit our discussion to the buying and selling of ordinary goods.* Such limitation contains no untruth; it merely fails to tell the whole truth. No harm has been done, however, if we realize the limitation under which our discussion proceeds.

PROBLEMS

1. What preceded specialization? Was there always specialization of industry into primary and secondary industries?
2. In what ways is specialization able to increase productivity?
3. "In production by specialists there are two leading considerations. One is differentiation, the other is unification." Explain. What determines the limits to which differentiation may be carried? What factors make for effective unification?
4. "Those participating in market transactions are agencies of co-operation." Explain.
5. Was there co-operation in the family economy? Would there be co-operation in communistic society? Would co-operation in these cases be effected through exchange?
6. "Exchange does not really help. Indeed, it hinders. Time and energy are spent in merely passing goods on." Do you agree? Summarize the social benefits of exchange co-operation.
7. When people congregate at a certain place and exchange goods by barter, do they constitute a market?
8. Is the retail grocery a market? Is the wholesale grocery store a market? Is the *place* the market? Suppose the wholesale store has no stock on hand but consists merely of an office, and office force, and means of communication with producers and retailers. Is it a market?
9. Draw up a definition of market.
10. Our society is often spoken of as a market society or a society of market structures. Show why these terms are appropriate. Would they have been equally appropriate if applied to English society in the manorial period?
11. What is meant by the expression "functional middlemen"? Name as many different functional middlemen as you can. What functions originally performed by merchants are still performed by merchants today?
12. "The social function of the business manager." What do you conceive it to be?
13. "The social function of the sales manager, or of the purchasing agent." What do you conceive it to be?
14. Explain how an understanding of his *social* function enables a purchasing agent or a sales manager to be a more competent business man. Be specific.

B. Market Forces, Marketing Functions, and Market Structures

If we have any one basic purpose in this chapter, it is that of getting an appreciation of the administrative problems and control devices found in modern purchasing and selling. It may accordingly

seem that we should at once pass to such topics as "Sales Management for a Manufacturing Business" and "The Work of the Purchasing Agent" instead of deferring their treatment, as we do, to pages 308 to 362 and 362 to 384 respectively. If, however, we should pass at once to specific discussion of these topics it would be a case of more hurry and less haste. We are studying business *administration*, which includes policy formation and is not confined to control of routine operations. Policy formation involves business judgment, and business judgment can be sound only when it is formed with as much awareness of background considerations as of immediate issues.

It is worth while, accordingly, to make a survey of the *forces* which have molded and are molding "the market world" in which the modern manager operates and which largely determine his judgments and largely condition his activities. It is worth while, also, to see marketing activities in terms of the *functions* which are being performed so that we may have a basis for judging the relative worth of various activities by measuring their contribution to some basic function. Finally, in the marketing field, as in other fields of human endeavor, ranges of *structures* (mail-order houses, jobbers, department stores, etc.) have come into being which are available for the use of the manager. Before he can select wisely among them, however, he must see them not as isolated facts but as devices (frequently alternative devices) which have been shaped by forces to accomplish ends. If he views the structures merely as structures they seem to be a miscellaneous, overlapping, self-contradictory, confused mass. Viewed in terms of forces and functions, however, order comes out of the seeming chaos.

In this present section on "Market Forces, Marketing Functions, and Market Structures" an attempt is made to give this background necessary for intelligent discussion of specific issues in purchasing and selling. There is a single selection (Selection 1) dealing with market forces and another selection (Selection 2) dealing with market functions. All the rest of the section is devoted to market structures. What are these structures? We begin by noticing (Selection 3) the methods of sale available and the relation of advertising to these methods. A hasty look is taken (Selection 4) at organized markets. We then pass to a study (Selections 5–13) of the outstanding structures which are utilized in the marketing of ordinary goods designed for individual consumption, the main attention being given to manufactured, rather than agricultural, commodities. Selections 5, 6, 7

deal with the structures used in "wholesaling." Selections 8-13 are concerned with retailing and here the most space is given to "massive" retail trade—to the mail-order house, the department store, and the chain store. We omit, except for passing notice, the co-operative movement, both in wholesaling and in retailing. The omission is not intended to imply that the subject is unimportant. On the contrary, associative activities of business men are very important and their importance is growing rapidly.

The discussion closes with a selection (Selection 14) showing that different structures are found useful in marketing different classes of commodities and with two selections (Selections 15 and 16) dealing with the breaking away, by marketing functionaries, from the orthodox system of distribution under the strain of the events connected with the second phase of the industrial revolution.

Perhaps there should be emphasized again the fact that in this chapter we are using the word market in a narrow sense (see p. 249). In accord with this use of the word market, we use the words "market structures" in a correspondingly narrow sense and exclude from discussion such structures and institutions as are, in highly specialized ways, dealing with transportation, financing, risk bearing, information gathering, etc. This narrowing of our attention to brokers, jobbers, wholesalers, retailers, etc., and this exclusion of banks, insurance companies, railroads, trade journals, etc., will do no harm if we can only keep it clearly in mind that the narrowing has taken place. We must remember that we are dealing with only one set of samples (a very important set, it is true) of our market structures.

Perhaps, too, it should again be emphasized that the matters in this section are background material for the later sections on "Sales Management for a Manufacturing Business" and "The Work of the Purchasing Agent." The student should keep his mind pointed toward these sections.

PROBLEMS

1. "The presence of highly specialized capital in modern industry makes it difficult to transfer from one industry to another and consequently makes it necessary for the manufacturer to study control of his market." Is this true? Is it the whole truth?
2. In 1800 the number of days of total formal schooling of the average American citizen was 82. In 1840 it was 208. In 1916 it was 1,180. What bearing have these facts upon the evolution of marketing methods?

3. Cite illustrations where developing technology has influenced marketing methods. Is the refrigerator car a case in point?
4. Tabulate definite reasons why a knowledge of the economic development of the last two hundred years will color the thinking and shape the acting of a sales manager.
5. "The trust movement, scientific management, schools of commerce, and imperialism are merely different phases of a single movement." Do you agree?
6. "Integration of industry and interlocking directorates have arisen in part out of marketing problems." Explain. Consult Selection 15.
7. "Large-scale operations in marketing have their roots down in the financial organization of society which has come into being." Explain. Be specific. Are their roots down in other soils also?
8. The following have been listed as advantages of large-scale production: (*a*) handling a large mass of goods; (*b*) purchasing over a wider market; (*c*) securing more competent and experienced buyers; (*d*) greater probability of regular demand; (*e*) greater ability to bear the risk of goods left on hand; (*f*) more effective advertising of goods; (*g*) more competent and experienced commercial travelers; (*h*) greater ease of securing high firm reputation; (*i*) greater variety of goods for individual taste; (*j*) better utilization of the principle of division of labor; (*k*) better mechanical equipment; (*l*) cheaper power; (*m*) better utilization of waste; (*n*) lower charges for transportation; (*o*) better financial arrangements; (*p*) better managerial ability; (*q*) ability to maintain research departments; (*r*) the saving of cross freights. What ones of these apply to factory production? What ones apply to marketing?
9. Be sure you know in considerable detail what is meant by these marketing functions: (1) assembling; (2) storing; (3) assumption of risks; (4) financing; (5) rearrangement; (6) selling; (7) transportation; (8) pricing; (9) information; (10) title transferring.
10. From what you know of early community life could there have been an assembling function then? What do the services of assembling include? Mention some of the middlemen who assist in carrying out these activities.
11. Producers have to perform the storage function to a certain extent, but they shift it as much as possible to middlemen. Why so? Under what conditions does a producer perform the storage function himself?
12. What are the reasons for the growth of specialized warehouses? Has developing technology had anything to do with it?
13. "The consumer when he buys in large quantities, performs part of the marketing function of storage." "The tendency has been for the consumer to shift this function back more and more to middlemen." What reasons could there be for the second situation?

14. Enumerate the kinds of merchandising risks. Who are the middlemen taking care of them? Do they care for them fully?
15. "The brunt of the financing burden is borne by the wholesale trades." Why or why not?
16. "Selling is the most important of the marketing functions and the most difficult one to perform." Is this true? What are the elements of selling?
17. You are about to engage in manufacturing commodity x. Do questions 1 to 16 raise issues which you need to understand?
18. Under what circumstances or in what types of cases are we likely to have organized markets?
19. Ascertain the meaning of such terms as jobber, selling agent, mill agent, factor, wholesaler, commission men, brokers, manufacturing jobbers, semi-jobbers, buying syndicates, co-operative jobbing, orthodox method of distribution. Why are there so many different types of middlemen? Can terms be sharply differentiated in this field?
20. What advantages are there in selling direct to jobbers?
21. What economic forces have brought about the development of the manufacturing jobber? What motives underlie co-operative jobbing?
22. "The retailer outside of the larger city department stores could not survive without the aid of the jobber." Explain what is meant. Of what importance is it to jobbers that the retailer be a good merchant?
23. "Buying associations have been organized by the 'regular' retailers of many cities and districts to meet the new condition." Whom are they fighting?
24. What advantages does the use of a branch house for distribution to retailers possess over the use of jobbers? What disadvantages?
25. What reasons can you give for the growth of mail-order selling?
26. "The mail-order house has used the right kind of publicity. The retail dealer, generally speaking, has not. This is why the catalogue house many times has the better of the argument. It has been repeatedly demonstrated that the retail store using proper advertising backed up by values, prices, and service, can simply walk away with the business, leaving the mail-order house far behind." Explain.
27. "The modern department store differs, as day differs from night, from the old-time general merchandise store." Explain.
28. If the department store divides itself into sections, each having its own selling and buying staffs, what economies can be effected?
29. What advantages has the department store compared with small retail one-line establishments? What disadvantages?
30. What types of chain stores are there? Why has each type developed?
31. What are the advantages and disadvantages of the chain store?
32. What general considerations are applicable to the development of mail-order houses, department stores, and chain stores? What special considerations are particularly applicable in each case?

33. Does the department store eliminate the jobber? Does it eliminate the jobber's functions? Answer the same questions for the chain store and the mail-order house.
34. Does the chain store eliminate the retail store? In case of a manufacturers chain is jobbing eliminated?
35. Does the co-operative scheme eliminate the retail store? Jobbing?
36. What are the advantages and disadvantages of massive retail trade as compared with small scale retail trade in the task of lowering costs of distribution?
37. "As a distributing device the public market looks simple—almost ideal—but the conditions of village and country life, of simple family wants, and of home industry, have largely passed away, and with them has gone the need for the public market." Do you agree? If so, why are there still public markets?
38. Can the middleman be eliminated? Answer fully.
39. You are about to engage in manufacturing commodity x. Do questions 18 to 38 raise issues which you need to understand?
40. Let us assume that costs of distribution are, speaking generally, very great in comparison with costs of manufacture. Can you construct a practical program for lowering these costs for the country as a whole?
41. "It is a mistake to try to discuss market structures in general. They vary from case to case and according to the work to be done." Defend or attack.
42. "The reason why manufacturers have middlemen market their goods at all is that they, the middlemen, can perform the marketing functions more cheaply than can the manufacturers themselves." How is this possible? Is the case for a large manufacturer any different from that of a small manufacturer?
43. Other considerations than mere cheapness or economy in marketing are often controlling motives for a manufacturer to assume the marketing functions." What are these "other considerations"?
44. "Well may a manufacturer hesitate before he undertakes to develop the organization and assume the expense of performing the marketing functions." What considerations enter into his decision?
45. "The tendency in modern merchandising seems to be for the manufacturer to assume more and more of the marketing functions." What grounds has the writer for making this statement?
46. "The great initiatives in distribution during the last 30 years have all been breaks with merchandising traditions." Illustrate by specific example what the author has in mind.
47. What is the jobber mix-up? "The whole mix-up has been caused by the attempt of some manufacturers or wholesalers to cut out one or more steps in the old-time distributive process, which was from manufacturer to jobber to retailer to consumer." Why are such attempts being made?
48. Draw up an outline of the main points in this section.

1. THE FORCES BEHIND MODERN MARKET STRUCTURES

The outlines of modern marketing structures will be more clearly defined in our minds if we have some appreciation of the forces which have shaped and are now shaping these structures, for, here as always, institutions have emerged and are emerging in terms of needs and of shaping forces.

We have already taken (see pp. 16 and 153) quick surveys of the forces that have been responsible for the break-up of the medieval economy and the emergence of our present economic organization. It is desirable, for our present purposes, to sketch in more detail some of the outstanding happenings of the last one hundred and seventy-five years.

We know that by 1750 English economic development had reached a stage which made possible that sudden change which we now call the Industrial Revolution. Governmental stability had created an environment in which political uncertainties, with their attendant hampering of economic development, were at a minimum; the beginnings of modern experimental science had laid the foundations for the development of modern technological industry; the expansion of the market (which had been really quite considerable in the period from 1300–1750) had developed and had tested commercial devices and structures; financial institutions had reached the stage where they could make significant contributions to the capital formation necessary under a régime of machine industry; risk-bearing institutions, notably the exchanges and insurance companies, were ready to play their part; in brief, the stage had been set for the entrance of the new economic order.

The outer habiliments of the new order were machine industry and indirect costs; the inner spirit was a complex of private property, laissez faire competition, the gain spirit, and customary survivals. It quickly demonstrated its powers for increased productivity of economic goods; so quickly, indeed, that industry after industry and nation after nation welcomed it and gave it dominance. It is our present purpose to see what this new order meant so far as marketing structures are concerned.

We shall be able to see this more clearly if we divide the period since 1750 into two periods. The first, running from 1750 to 1880, may be called the period of the emphasis upon production and the all but universal acceptance of the orthodox system of distribution, or

"marketing through the producer to the wholesaler to the retailer to the consumer." This was the first phase of the revolution. The second phase (1880–?) is still with us. It is marked by increased emphasis upon production *at lower cost* and by the development of many other systems of distribution (such as direct selling, chain stores, mail-order houses, etc.) alongside the orthodox system. Of course, the dates used in this statement are arbitrary. The actual dates varied from industry to industry and from nation to nation and were in no case single years; they were always transition periods. So also the characterization of the periods is arbitrary, being designed to suit our present needs. These commercial and industrial changes are in fact only a part of the full story. To tell the full story would be to tell of no inconsiderable portion of human endeavor and aspirations of the last two centuries.

Speaking broadly, the outstanding feature of the first period for our purposes is the fact that the market was expanding more rapidly than productive power was increasing. This statement is at first thought a bit surprising, for we think, properly enough, of this period as the one of the coming in of machine industry; as one of a tremendous increase in producing capacity. This is entirely true, but it is also true that the market increased even more.

This rapid increase of the market was in part due to technological industry itself. In the form of the canal, the railroad, the telegraph, and the telephone, technology opened markets in an astounding fashion. Of course, the way had been prepared. The preceding period had been one of colonization by the European nations. This colonization had opened the edges of the continents of North America, South America, Africa, and Australia and had made possible the political organizations under whose auspices modern economic communities could arise and technological industry could develop the markets for its own products. Then, too, the spread of printing and of formal education contributed to a reaching for a higher standard of living at the very time when increased production made measurably possible the attainment of the higher standard. Not even the most rapid increase of population the world has known served to check the rise of this standard. It served mainly to expand still more the market for goods.

In such a situation the typical producer of goods for individual consumption found himself in a position which called for less worry over marketing problems than over production problems. The

market seemed ready to absorb output at almost any reasonable cost, and if perchance one market was lost another rose to take its place. Under such circumstances it was natural for two very interesting sets of institutions to be emphasized. Upon the one hand the producer, not greatly disturbed over any possible loss of control of his market, was willing to delegate marketing functions to the jobber or wholesaler. Presumably the jobber, eager to get goods which he could market, would "play fair"; if he did not, there were other jobbers eager for the goods. The producer, reasonably sure of a market in either event, and still somewhat under the influence of the traditions of simpler industry when overhead costs were not such a burden as they are today, did not trouble himself much over the possibility that he might have to change "his line" because of lack of market, and accordingly acquiesced and indeed co-operated in establishing the orthodox system of distribution. Of course, few if any producers reasoned it out in such terms. They simply drifted with the tide. We today can sense the direction of that drift.

The other interesting set of institutions—the schools of technology—arose out of the demand for ever increasing producing capacity and out of the background of the physical sciences. We can now see that it was no accidental matter that such schools arose in this period. They were an answer to society's demand, voiced through prices established in the mechanism of the market, for more and more products.

With the opening of the commercial revolution, as the second phase of the Industrial Revolution is sometimes called, there was a shifting of forces. Again speaking broadly, the outstanding feature of this second period is the fact that productive power is expanding more rapidly than the market. This reversal of currents is partly the result of the developments of technology in the earlier period. It is partly the result of the fact that the more responsive markets have been fairly well exploited. It is partly due to a checking of the rate of increase of population. Doubtless there are other causes.

Interestingly enough, this checking of the rate of increase of the market has not meant any diminution in the emphasis upon production. Quite the contrary. The presence of indirect costs in modern industry makes any falling off in output a thing to be dreaded; any increase in output is a thing to be coveted. The producer is therefore in a strange situation. He wishes to increase output at the very time when the market is not expanding rapidly. In a

sense he is forced to fight against the drift of events and he uses any weapons upon which he can lay his hands. For one thing, he seeks to get and to hold his market by national advertising, by monopoly, by price maintenance, by establishing his own branches, by mail selling direct to consumer—by hook and by crook. Here we have the outstanding reason for the building up of many systems of distribution parallel to the orthodox system—and sometimes supplanting it. For another thing, he strives to reduce his costs, often as a means of coaxing the market to respond. Here we catch a glimpse of the forces behind cost accounting, scientific management, and the increased emphasis upon schools of technology. For another thing, he wheedles society into establishing schools of commerce, and through them, through government bureaus, and through private researches he studies ways to expand the market. For still another thing, he helps to influence nations to embark upon an "imperialistic" policy which has meant a new emphasis upon colonies and has contributed not a little to the causes of our Great War.

Doubtless, we are still too near the events for us to have a well-balanced conception of the forces which have shaped and are shaping present-day marketing structures. We can, however, enumerate some of the major forces and can see, in the rough, how they are working.

1. The increase which has taken place in market area should be enumerated as a background condition—if not a force—which helps to explain modern market operations and structures. Upon the one hand the space area of the market has been greatly increased by improvements in such fields as transportation, communication, and administrative control; upon the other hand the time area has been increased by various devices ranging from refrigeration to the hedging operations of an organized exchange. These increases in area, taken with what might be called an increase in the depth of the market (greater demand and consuming power) have made necessary changes in market structures to meet the new conditions.

2. Next, we should list the change in the balance of many forces as a consequence of which "production is now outrunning the market." This has been sufficiently discussed in the preceding pages. It helps to explain the origin of many devices for getting and keeping "a grip upon the consumer."

3. The increasing reliance upon the principle of specialization is another factor worthy of mention. In part, this reliance is a rational

one. Specialization does make possible better quality and greater quantity of economic goods and is usually to be encouraged where the market is sufficient to justify it. It is quite possible that we carry our specialization beyond limits justified by reason. It matters little for purposes of our present discussion. The growing reliance upon specialization makes the environment a favorable one in which to launch new specialized devices in marketing. The diagram on page 247 shows how true it is that the history of the development of market structures is in part a story of developing specialization.

The increasing specialization in producers' instruments (for this is also a feature of modern specialization), coupled with the tendency to large-scale production, plays its part in determining market structures. It is increasingly difficult to transfer specialized capital from one "line" to another without great loss. It is accordingly increasingly important to keep a grip upon the consumer so that this transfer may not be necessary. Marketing devices are therefore built up which will aid in holding the consumer.

4. Closely related to all this is the growing importance of indirect or overhead costs in industry. We have already seen that these costs make increased output a thing to be coveted. In a business where the major part of the total cost is overhead, a 10 per cent change in the volume of the business may very well spell the difference between bankruptcy and very large profits. A steady volume of business is, furthermore, almost as important as an increasing volume. Small wonder that market devices to hold the consumer are emphasized in modern industry!

5. The growing dependence upon large-scale production should also be listed as a force which is shaping market structures. Goods are made to be marketed. Modern large-scale factory production, in and of itself, accordingly leads to increased attention to marketing, both in order to secure the large demand which will enable the increase of output and in order to secure the steady demand so essential to regular, economical production. Large-scale marketing is therefore quite likely to develop parallel to large-scale factory production. This tendency is accentuated by certain economies which are possible in large-scale marketing, such as those connected with the more economical handling of the material, with better prices in large-scale operations, with better freight rates for large lots, with better research or investigating facilities, with economy of both routine and administrative labor, and with economy of capital. Possibly "the

economy of large-scale production" is becoming something of a fetish. No matter. Our increasing faith in it, justified or not, helps to explain the scale of many of our marketing structures.

6. We should not fail to list the expansion of popular education. In 1800 the total number of days of formal schooling of the average American citizen was 82; in 1840 it was 208; in 1916 it was 1,180. If these data are taken as samples of what has been occurring in popular education it is readily seen how "selling by description" (see p. 269) has come to be so widely used. As one example of a resultant market structure notice that the mail-order house owes much to the spread of ability to read and write.

7. This leads naturally to our listing the rising standard of living as a force which is shaping market structures. We say that "service marketing" is frequently more profitable than "price marketing." Why? It gets its appeal through the rising standard of living. Not a few of our market structures are shaped in recognition of this appeal.

8. The steady development of facilitating agencies, such as insurance, transport, advertising, finance and administrative-control devices, should not escape notice. Of course, they are results as well as causes, but they *are* causes. For example, modern massive retail trade is much indebted to the development of modern sound large-scale financial institutions.

9. Not least in importance is the growing tendency toward associative effort. Whereas the period prior to 1880 was one that put stress upon the *competition* of specialists, the present period is increasingly one of *association* of specialists, whether competing or non-competing. Sometimes this association results from a desire to reap the advantage of large-scale operations as ordinarily conceived; sometimes it results from the desire to reduce risks by combining them or by increasing information (see chap. vii); sometimes it is only a vague "setting up of an impersonal device to cope with the impersonality of modern society"; sometimes it is a combining against a common foe, real or imaginary; sometimes other causes are operative. Whatever the causes, there is in men's minds today a strong current setting in the direction of associative effort and its importance should not be minimized when one is searching for the causes of present-day marketing structures.

10. Developing codes of business ethics and developing standards of other aspects of social control of business activities have played their part. Selling by description may again be cited in illustration.

It is highly dependent both upon formal social control as reflected in law and upon informal social control as reflected in codes of business ethics.

By this time it has probably occurred to the reader that this catalogue of "market forces" is nothing but a citation of some quite "general forces" which are operating in our economic organization, with particular reference to the way they affect marketing considerations. So it is. But that is enough. Look back over the catalogue asking whether it helps to explain the emergence of the department store, or the chain store, or the mail-order house, or direct selling, or any other of the newer market structures. If it does, it has answered its purpose.

2. MARKETING FUNCTIONS[1]

[The function of the market in modern economic society is that of assisting in the co-operation of specialists (see pp. 242–47). This selection on marketing functions is an analysis, in functional terms, of the operations carried on in the market.]

The services that must be performed in getting commodities from producer to consumer are usually called the "functions of middlemen"; in the title of this paper they are referred to as "marketing functions" because they are not always performed by middlemen, but often to a greater or less extent by the producers themselves, and often even by the final consumer.

The services performed in the marketing process, including practically every item in the detailed expense account of a merchant or of the selling organization of a manufacturer, can be classified under one of the following heads: (1) assembling; (2) storing; (3) assumption of risks; (4) financing; (5) rearrangement; (6) selling; and (7) transportation. [Others have made different lists of marketing functions. One such list is as follows: (1) information giving; (2) transporting; (3) pricing; (4) title transferring and affirming; (5) storing; (6) financing; and (7) risk bearing.]

1. *Assembling.*—When communities were self-sufficing, there was no need of collecting or gathering commodities from distant places. But with the development of territorial specialization both in agriculture and manufacturing, the assembling of commodities from

[1] Adapted by permission from L. D. H. Weld, "Marketing Functions and Mercantile Organization," in *American Economic Review*, VII (1917), 306–18.

various places became a more or less difficult function to perform. The term "assembling," as used here, does not mean the actual physical transportation of commodities from one place to another, but rather the seeking out of sources, the making of business connections whereby commodities may be bought, and the study of market conditions so that they may be bought at the lowest price possible.

Assembling therefore involves all the services connected with *buying*. Many wholesale houses assemble goods from different parts of the country—even from all corners of the earth. They have their specialized buyers, who not only go to trade and manufacturing centers to buy goods, but who have to make a constant and continuous study of market conditions, sources of products, qualities, grades, styles, etc. Many large houses maintain permanent buying offices in market centers, as, for example, the dry-goods wholesalers of Chicago, who maintain buying offices in New York. It is a common practice for wholesalers and even large retailers to send buyers abroad, and some, as Marshall Field & Company, even maintain permanent buying offices in several foreign cities. But the assembling from foreign countries is largely performed by a specialized group of merchants known as importers.

Sometimes the buying function is so difficult and expensive to perform that jobbers employ independent purchasing agents in distant markets, who buy in larger lots than individual jobbers can handle, who have a more expert knowledge of market conditions and prices, and who keep their clients informed from week to week on these matters. This is common in the hardware trade. Department stores do not rely on jobbers to assemble goods for them. They buy largely from manufacturers, which involves sending buyers to eastern markets; and some of the largest stores, especially in the East, maintain permanent buying headquarters in New York. But the majority of department stores cannot afford such expensive buying organizations, and although they send their buyers to New York, they employ either "resident buyers" or their own co-operative buying syndicates to keep them in touch with market conditions, to tell them where they can buy to best advantage, to execute "fill-in" orders, and to provide desk space for their buyers when they are visiting New York.

Not many years ago, it was the practice of country merchants to visit large cities perhaps twice a year to order a sufficient supply of goods for the season. This was a cumbersome and costly method

of assembling; it involved loss of time, poor selection of goods, purchasing too large a stock at a time, and unsatisfactory credit conditions. The assembling function for country merchants is now taken over very largely by jobbers.

Many other examples might be given of the importance and difficulties connected with assembling. It is one of the principal functions of wholesale produce dealers and commission merchants, who send solicitors into the producing regions to make business connections, who assemble first from one part of the country and then from another as crops mature in different climates, and who make a continuous study of crop and weather conditions. Brokers often help in the assembling function, in connection with both agricultural and manufactured products, although they more commonly represent the seller than the buyer.

2. *Storing.*—Storing, in its broad sense, means the holding of stocks of goods at convenient points. It involves expense for warehouse or storage fees, store space, and interest on capital employed. Producers have to perform the storage function to a certain extent, but they shift it as much as possible to middlemen. Manufacturers prefer to manufacture "on order," so that they may deliver the finished goods as fast as they are turned out; but many have to manufacture "for stock," thereby keeping capital tied up in finished goods on hand.

Retailers perform this function by keeping the shelves of their stores filled with goods. The tendency is for middlemen to reduce it as much as possible by purchasing goods in small quantities and very frequently; because small stock in proportion to sales means faster turnover and larger net profits. This tendency is especially noticeable among retailers, who shift the storing expense as much as possible to jobbers. Jobbers in turn always have warehouses with complete stocks, and the fact that retailers are buying in smaller and smaller quantities, but more frequently, accounts largely for the development of small jobbing centers, as in the grocery trade, and for the establishment of branch houses by large jobbers, as in the hardware trade. About the only middlemen who perform practically no storage function are brokers, manufacturers' agents, and purchasing agents.

The storing function is so difficult and expensive to perform in some cases that it is taken over by a specializing set of warehousemen General warehouses are found in all large cities, and

in them all conceivable commodities are held. A sugar refiner on the Atlantic Coast, for example, needs to keep supplies of sugar on hand at large distributing centers throughout the country, and he has the choice of building and maintaining his own warehouses or renting space in public warehouses. He finds it cheaper to pursue the latter course. The large meat-packers, on the other hand, find it to their advantage to maintain their own warehouses, partly because they require a specialized service and equipment not furnished by ordinary warehouses, and partly because they do business in large volume. Agricultural products, which are seasonal in character, demand special forms of storage facilities, usually furnished by independent warehousemen. Cases in point are grain elevators, cotton warehouses, and tobacco warehouses. And when the element of preservation enters in, cold-storage houses are required. The storage function has to be performed all along the line, from producer to consumer. Even the consumer, when he buys goods in large quantities, performs part of the marketing function of storage; but the tendency has been for the consumer to shift this function back more and more to middlemen.

3. *The assumption of risks.*—Inasmuch as commission merchants, brokers, and agents do not take title to goods, they assume very few of the merchandising risks; but practically every other middleman, as well as the manufacturer, especially when he produces for stock, has to consider the element of risk. The principal kinds of merchandising risks may be enumerated as follows: (1) price fluctuation, (2) destruction by fire, (3) deterioration in quality, (4) style changes, and (5) financial risks. [See also chap. vii.]

Perhaps the most important risk is that of price fluctuation; but its importance varies for different commodities. Branded and advertised articles are relatively stable in price though during war times they too suffer somewhat from price changes. The risk of price fluctuation is greater to wholesalers than to retailers because of the smaller margins on which the former carry on business. Many articles handled by wholesale grocers, such as flour and sugar, fluctuate in price very frequently and are handled on extremely small margins, and the merchandising risk accordingly becomes great. When one buys or sells with the idea of making a profit from mere price fluctuations, he becomes a speculator. In this sense wholesale grocers often speculate in flour and sugar and some other commodities, and oftentimes a large part of their net

profits (or losses) is due to this feature of their activities. In the case of a few raw products—wheat, corn, oats, flaxseed, cotton, sugar, and coffee—price changes are frequent, merchandising risks are great, and speculation becomes an important factor. Much of the merchandising risk is shifted through the hedging process to professional speculators, a specialized class of risk-assumers.

The risk of destruction by fire is largely shifted to insurance companies. Deterioration in quality is a danger affecting principally perishable articles, but to some extent is also a risk factor for general merchandise, which may become shopworn. Many articles need special facilities for their handling—warm rooms, dry rooms, refrigerated rooms, etc.; and the storage houses, as well as the railroads, help in the prevention of deterioration. Style changes in manufactured goods are analogous to perishability of farm products. They constitute an important risk factor in men's and women's wear, especially the latter; and the frequency of style changes appears to be increasing, as exemplified recently in eye glasses and women's footwear. Financial risk appears in loss from uncollectible accounts, but may be largely overcome by the maintenance of credit departments. Financial risk is also involved in the other forms of financing described below.

4. *Financing.*—Middlemen were formerly merchandise bankers. This function has been largely taken over by banks, which in this sense are middlemen of a specialized kind. And yet we should not lose sight of the fact that middlemen still perform extremely important financing functions, and in a variety of ways. Perhaps the most important is the granting of credit—retailers to consumers, jobbers to retailers, and sometimes manufacturers to jobbers. In many cases, however, the manufacturer has to be financed: as in the cotton trade, where commission houses make advances or endorse the mill's paper; or in the silk trade, where raw-silk dealers furnish the raw material on six months' time. Furthermore, manufacturers are commonly financed by being allowed to draw drafts on day of shipment, a method also common in financing shippers of farm products.

The financing function involves the tying up of capital, with resulting interest charges, also a line of credit with banks and the expenses connected with accounts and collections. On the whole, the brunt of the financing burden is borne by the wholesale trades, or sometimes by commission merchants. Retailers and consumers are generally weak so far as accumulation of capital is concerned,

and, on the other end of the marketing chain, manufacturers generally find it difficult to finance their own undertakings; so that the financing function of the wholesale intermediaries commonly extends in both directions. This is especially true in the marketing of farm products. Furthermore, the wholesalers, because they are located in trade centers and have quick assets, are the ones who are in the best position to obtain credit from banks.

5. *Rearrangement.*—Rearrangement of commodities involves sorting, grading, breaking up large quantities into small units, packing, etc. This is one of the principal functions performed by many merchants in raw materials. Wool dealers, for example, in addition to their assembling and financing functions, are practically indispensable to manufacturers on account of the fact that they are important as graders and classifiers, and stand ready to furnish the particular quality of wool desired at any time. In the farm-products trade, sorting and grading are of supreme importance; furthermore, these commodities reach large cities in carloads, and have to be split up into small quantities, according to the demands of individual retailers. This function is important even in the marketing of standard and non-perishable commodities; wholesalers often receive goods in bulk, and have to weigh them out and package them. Goods that are already packaged when they reach wholesalers are usually put up in cases or cartons, but owing to the tendency among retailers to buy in smaller quantities, cases have to be broken open, goods in one-third or one-sixth of a dozen lots collected from the different cases, and repacked for shipment. Even retailers have the function of rearrangement to perform to a certain extent. They have to weigh out sugar, coffee, nails, wire, etc., and measure and cut cloth; then they have to wrap for presentation to customers.

6. *Selling.*—Selling is the most important of the marketing functions, as well as the most costly one to perform. Salaries of salesmen (plus traveling expenses in many cases) constitute generally the most important single item in a merchant's expense account. Selling involves both creating a demand for the goods and getting the goods into the hands of the purchaser. Though both of these phases of selling are performed largely by personal salesmen, demand creation is being accomplished more and more by means of advertising. Advertising is used either because it is the only possible way of creating a large consumer demand, or because it is the cheapest

way of arousing such a demand. When a manufacturer advertises, he turns over the actual work of preparing copy, selecting mediums, etc., to another functional specialist—the advertising agency.

It is still necessary for most manufacturers, jobbers, and retailers to employ personal salesmen, but, because of the great expense attached to this method, it is only natural that many of the important recent attempts to reduce merchandising costs should have been along the line of eliminating salesmen's salaries as much as possible. The mail-order houses, both wholesale and retail, do away with salesmen altogether; local buying syndicates among retail druggists effect their principal saving by substituting the telephone for salesmen; the slot-machine does away with salesmen, and the slot-machine type of retail store, like the Horn and Hardart restaurants and the "all-package" grocery stores, seems to be gaining ground.

7. *Transportation.*—Merchandise middlemen formerly attended to the actual carriage of goods from one place to another more than they do now; but this function has been largely taken over by railroads and other transportation agencies that are specialized middlemen in this field. Transportation, however, is still an important function of merchants. Wholesalers and retailers frequently use their own trucks for hauling goods from freight stations to their stores, though more commonly drayage companies are employed. The principal transportation function still performed by merchandise middlemen is that of delivering goods from store to customer.

As already stated, a clear conception of the marketing functions is fundamental to a proper understanding of the mercantile structure. The splitting up of the marketing process among successive middlemen is merely a case of specialization in marketing functions.

3. METHODS OF SALE AND ADVERTISING

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In the early stages of our industrial history, sales were made in bulk. At all stages in distribution, the purchaser saw the actual goods before the sale was made.

[1] Adapted by permission from A. W. Shaw, "Some Problems in Market Distribution," in the *Quarterly Journal of Economics*, XXVI (1912), 721–23, 743–46. Later published in *An Approach to Business Problems*. (A. W. Shaw Company, 1916.)

Later sale by sample appeared. The purchaser bought goods represented to be identical with the sample he was shown. The introduction of this method of sale was necessitated by the widening of the market and was made possible by improvement in commercial ethics and by increasing standardization of the product. The purchaser must have confidence, not only in the honest intention of the producer to furnish goods identical with the sample, but also in his ability to produce identical goods. Hence, increasing uniformity in product through machine methods of manufacture was a factor in the increase of sale by sample.

Sale by description is the most modern development in distribution. An even higher ethical standard is required than for sale by sample. Moreover, sale by description requires a higher level of general intelligence than sale in bulk or sale by sample. Sale by description in its modern development is, in a sense, a by-product of the printing press.

The root idea in sale by description is the communication of ideas about the goods to the prospective purchaser by spoken, written, or printed symbols. This takes the place of the sight of the goods themselves or a sample of them. It is obvious that this requires grasp ideas either through spoken, written, or printed symbols.

The use of the term "symbols" rather than "words" is necessitated by the fact that photographs and sketches are today an important feature of sale by description. A photograph of the commodity often serves the purpose of pages of verbal description.

Advertising, in the sense here used, is to be defined as the communication to possible purchasers, by written or printed symbols, of ideas about the goods, designed to create a demand for the goods. In this broad sense it includes, not only selling letters and circulars, but newspaper and periodical advertising, bill-boards and window cards, electric signs, street-car advertising, catalogs, and all the varied forms of modern commercial publicity. A rough classification is made between general and direct advertising. General advertising includes newspaper and magazine advertising, bill-boards, electric signs, street-car advertising and the like, aimed at the general public or some section of it. Direct advertising is used in reference to the sending of selling letters, circulars, or catalogs to the persons whose names appear on a mailing list and to reach whom the material sent is specially adapted. This classification is of some importance in discussing advertising as an agency in distribution.

We cannot here attempt an adequate discussion of modern advertising in its varied phases. And it is perhaps not necessary, so much is it today forced upon the attention of each of us. To realize the machinery now provided for the direct communication of ideas about goods, one has but to consider that a single publishing company today reaches through two magazines about three and three-quarters million families; that there were in this country in 1911, according to the *Statistical Abstract*, 22,806 newspapers and periodicals. A fair measure of the development of advertising in recent years is found in the rapid progress of invention to facilitate advertising—photography, the half-tone process of reproducing photographs and drawings, the three-color process for such reproduction, the cheapening and perfecting of papers, inks, and printing, and better reproducing machinery.

It is necessary to include in this hasty and incomplete analysis of advertising as an agency in distribution a reference to the character of the demand aroused by advertising. Advertising may be said to build up three general classes of demand: (1) expressed conscious demand, (2) unexpressed conscious demand, and (3) subconscious demand.

The three classes may be illustrated by supposing a product for sale by grocers to be advertised in a periodical of large circulation by a double page costing for one insertion $8,000. If as a result of the advertisement 30,000 people go to the grocery and buy the product, 60,000 plan to purchase the product at some future time when such an article is needed, and 100,000 more become open to a further exciting force, such as seeing the product at the grocery and recognizing it as one advertised, then we should call the 30,000 the expressed conscious demand, the 60,000 the unexpressed conscious demand, and the 100,000 the subconscious demand resulting from the advertisement. Expressed conscious demand means present sales; unexpressed conscious demand means future sales; subconscious demand means that the field has been fertilized so that future selling efforts will be more fruitful. Unexpressed conscious demand and subconscious demand are difficult of measure but must always be taken into account in any consideration of the efficiency of advertising as a selling agency.

B[1]

ORGANIZATION CHART OF AN ADVERTISING AGENCY

[This statement of the constituent elements of the organization of an advertising agency serves to indicate the functions of this specialized agency in the marketing field.]

1. Research Plan and Business Counsel Department
   - *a*) Conferences with clients
   - *b*) Market and trade investigations
   - *c*) Analysis and reports
2. Intelligence Department
   - *a*) Publicity for clients
   - *b*) Statistics and news to clients, from newspapers, magazines, trade papers, statistical bulletins, etc.
3. Copy Department
   - *a*) Advertisements, booklets and folders, circulars, letters, campaign portfolios, catalogues, house organs
   - *b*) Trade marks, labels, packages, slogans
   - *c*) Window and counter displays, car cards, posters, theater slides, novelties, samples, demonstrations
4. Art Department
   - *a*) Within the organization
   - *b*) Outside art service
5. Rate and Space-buying Department, estimating, scheduling, and ordering space in
   - *a*) Newspapers, magazines, farm papers, trade papers, class papers and miscellaneous publications
   - *b*) Posters and painted signs, street car cards, electric signs, and motion pictures
6. Mechanical Production Department
   - *a*) Halftones, zincs
   - *b*) Electrotypes, stereotypes
   - *c*) Typesetting
   - *d*) Printing
   - *e*) Shipping
7. Service Department
   - *a*) Job orders to all departments
   - *b*) Following orders to completion
   - *c*) On time forwarding of copy and cuts
   - *d*) Job reports to clients

[1] Adapted by permission from the organization chart of Johnson, Read & Company, Chicago.

8. Filing and Checking Departments
   a) Filing publications
   b) Filing data, proofs, etc.
   c) Checking insertion
9. Financial Department
   a) Credit
   b) Accounting
   c) Auditing
   d) Billing
   e) Collections
10. Extension Department
   a) Organization or House Advertising
   b) Organization or House Salesmen
   c) Organization or House Conferences

4. CONDITIONS WHICH MAY RESULT IN ORGANIZED MARKETS[1]

"An organized market" is one the proceedings of which are formally regulated. As a rule those who deal on it are in effect a a corporation: they elect new members and also the executive of their body and appoint the committee by which their own regulations are enforced. In some countries their status is fixed and their actions are superintended by Government. Their regulations generally provide, implicitly or explicitly, for the completion of a contract to buy or sell a quantity of a definite commodity at a certain price, by the utterance of a few words on the one side, and by a brief response, sometimes a mere nod, on the other. They generally prescribe a rather large unit as that to which the contract refers, at all events in the absence of any specific statement to the contrary.

The chief conditions needed for rendering any class of products suitable to be handled in an organized market are, (1) that it be not quickly perishable; (2) that the quantity of each thing can be expressed by number, weight or measure; (3) that its quality can be determined by tests that yield almost identical results when applied by different officials, assumed to be expert and honest; and (4) that the class is important enough to occupy large bodies of buyers and sellers.

[1] Adapted by permission from Alfred Marshall, *Industry and Trade*, pp. 256–58. (The Macmillan Company, 1919.)

These conditions are sufficient to render organized marketing practicable. But a fifth condition is required to make it attractive: it is that the class of things dealt in should be generally liable to considerable fluctuations in price. For otherwise the dealings would be confined almost exclusively to producers, consumers, and merchants: there would be little scope for those professional dealers who make a living by speculative purchases and sales; and who in some cases render great public services by carrying risks that would otherwise need to be borne by people whose special aptitudes lie in other directions. It is true that this beneficent work is often marred, and sometimes over-borne, by evil practices which intensify fluctuations and mislead honest dealers: but, for the present at least, that evil has to be taken with the good. An organized market generally gives scope for purchases and sales for immediate delivery; and for dealings in "futures," that is in goods to be delivered at specified future times.

This fifth condition implies that the things in question are not of such a nature, that their supply can be varied by rapid and extensive changes in the rate of production; so that their price is prevented from fluctuating rapidly, and remains always close to normal cost of production. There are few material things which satisfy all these conditions in very high degree: the chief among them are various grains, especially wheat; and raw cotton. The authorities of each organized produce market define the standard, or standards, in which dealings may be made; and all produce, which comes for delivery in these dealings, is inspected and certified as being truly up to the standard which it claims.

Comparatively few transactions in futures lead to the actual delivery of the produce. In most cases the buyer pays to the seller any amount, by which the official price of the quantity sold may have fallen below that at which the sale was made; or receives from him any amount, by which it may have risen. Either side may insist on completion: but that is generally effected through the organization of the exchange, by bringing together those who wish actually to deliver with those who wish actually to receive; the rest being "rung out." The practical effect of this is that anyone can as a rule buy a future, without being called upon to pay its price either at the time of making the contract, or afterwards. Each party is required to put in a "margin," which will cover a small movement of the price against him: and, as soon as the price moves considerably

against him, he is likely to be required to make a corresponding addition to his margin.

See also p. 688. The Hedging Operations of an Organized Exchange.

5. LEADING WHOLESALE AGENCIES[1]

Wholesale merchants are business men who buy and sell merchandise on their own account for distribution to retailers in lots smaller than those in which the wholesaler buys. The wholesale merchant is a large factor in the distribution of many products to unit stores. Although there are some manufacturers who sell their merchandise direct to retail grocers, for example, nevertheless they constitute but a small minority. Such manufacturers, furthermore, find it necessary practically to duplicate the organization and to assume the functions of the wholesale grocer, usually incurring at least as much expense as the wholesale grocer incurs in operating his business.

The specialty wholesaler represents a differentiation from the ordinary wholesale merchants, such as are referred to above. In New York, for example, there are a number of wholesalers who handle only hosiery and knit goods. The tea and coffee wholesaler is another specialty merchant. These specialty wholesalers generally cover a wide territory in the sale of their products and develop a demand through especial care in the selection and quality of the merchandise that they handle.

There are a few catalogue wholesalers in the United States. One of the most notable examples of these is Butler Brothers of Chicago. The catalogue wholesaler does not employ a force of traveling salesmen but sells on mail orders.

Merchants' co-operative wholesale associations, or buying exchanges as they are sometimes called, have been developing more rapidly during the last ten years than prior to that time. The oldest of them have been in existence for twenty-five years or more. These co-operative buying associations have had their greatest development in those trades in which the wholesale merchant is also a large factor. They are direct competitors of the wholesale merchant, but in the grocery trade at least the co-operative buying associations deal chiefly in staple merchandise.

[1] Adapted by permission from M. T. Copeland, "Scope and Content of a Course in Marketing," in *Journal of Political Economy*, XXVIII (1920), 375–98.

The fruit-and-produce trade presents a series of particularly complex marketing problems. They are concerned primarily with the large urban markets. The inhabitants of the large cities and the industrial districts of the United States are supplied with fresh fruits and vegetables from a wide area. The trade is one of especial difficulties because of the fact that a constant, regular flow of merchandise is essential and also because of the perishable nature of the merchandise, which involves danger of loss through spoilage or through glutted markets.

The commission merchant is one of the chief agencies for the handling of fruit and produce in large cities. Ordinarily the commission merchant receives shipments on consignments from farmers or from country dealers. These shipments are sold at the prices that are current when the shipments arrive. After deducting his commission fee and any incidental expense that he may have incurred, the commission merchant remits the balance to the shipper. This system enables the shipper to ship his merchandise whenever it is ready without awaiting specific orders from the commission merchant. It also enables the shipper to obtain the benefit of the prices that are current at the time that the shipments arrive at the market.

Many commission merchants, furthermore, buy and sell on their own account, thus acting as jobbers. This combination of a commission merchant and a jobbing business, while it has some advantages occasionally even to the shipper, has not ordinarily worked out well in any industry in the long run. The conflicts of interest tend to create distrust and dissatisfaction.

In the large urban markets there are several other agencies through which produce may be sold. There are car-lot receivers who buy outright on their own account. Some of these receivers, and also some of the other types of middlemen, send out buyers to purchase produce or to contract for it in the growing districts.

The broker, who handles a portion of the trade in produce, sells for a brokerage fee shipments consigned to him. Ordinarily the broker, however, sells only upon confirmation of the price by the shipper. The broker as a rule deals only in car lots.

The jobber in the fruit-and-produce trade buys from car-lot receivers, brokers, or commission merchants, and sells to retailers. He performs the regular wholesale merchants' functions.

The trade in citrus fruits and occasionally in other products in several large cities is carried on through auctions. These auctions are ordinarily held daily, and sales are made directly at the freight terminal to jobbers and large retailers. The auction system can be used advantageously only where there are large shipments of carefully graded produce.

A notable development in the field of marketing during recent years has been the growth of the California Fruit Growers' Exchange, probably the most successful example of a co-operative association of producers. The success of this organization has undoubtedly been due in part to special circumstances, such as the specialized, capitalistic nature of the industry, an all-the-year-round production, and previous experience in co-operative efforts for other purposes. Not least, among other reasons, is the distance from the market, which has placed a premium upon the effective control of shipments, with diversion in transit in order to have the fruit delivered at the markets paying the best prices and to avoid gluts.

There are numerous instances of manufacturers who have established wholesale branches for the distribution of their products directly to retailers. They have thus assumed completely the functions and the expenses of the wholesale merchant. In few cases does it appear that there has been a substantial saving in expense by the adoption of this policy. The objects have generally been to facilitate more aggressive selling or to meet some special conditions in the industry.

Frequently a manufacturer feels that his product does not receive enough individual attention from the wholesalers and their salesmen. He believes that by coming directly in contact with retailers, he will be able to push his goods more effectively against the products of his competitors. He values the good will of the retail merchants and believes that he can secure it more certainly by dealing with them directly. In other instances, the manufacturer establishes a system of wholesale branches in order to maintain a more steady production load for his factory. With a system of wholesale branches the seasonal fluctuations in the volume of sales may be lessened. Among the industries in which the operation of manufacturers' wholesale branches is conspicuous is the meat-packing industry.

See also p. 56. The Location of the Wholesale Dry-Goods Trade.

6. MARKETING AGENCIES BETWEEN MANUFACTURER AND JOBBER[1]

This class of middlemen comprises commission houses (sometimes known as selling houses), manufacturers' agents, brokers, and purchasing agents. Commission houses are common in the cotton, woolen, and silk goods trades, and are found to a certain extent in the hosiery and knit goods and "notions" trades. Manufacturers' agents are common in the grocery and hardware trades, and brokers are very important in the grocery trade. An interesting form of the purchasing agent is found in the hardware trade. Similar middlemen appear to a certain extent in other trades, but the reason for their existence and their methods of doing business may be understood by studying them in connection with the three trades enumerated above, viz., textiles, hardware, and groceries.

It appears that intermediaries between manufacturers and jobbers perform but few of the marketing functions mentioned in Selection 2. They rarely store any commodities for their principals; they assume but little risk because they do not take title to the goods; they have practically no sorting and grading because they sell in large quantities and rarely handle the goods at all; and they do none of the transporting. This leaves the actual selling of the goods, which is their most important function; financing, which is important in the textile trades but not in the hardware and grocery trades; assembling, which they perform by representing manufacturers who are often located in different parts of the country.

The purchasing agent is fairly distinct from the other three forms of middlemen described here because he represents buyers rather than sellers, but it is rather difficult to draw clearly the lines of demarcation between commission houses, manufacturers' agents, and brokers, especially as they merge into each other in certain cases.

The distinguishing features of commission houses, which are found primarily in the textile trades, appear to be as follows: They generally market the whole output of each mill that they represent or the whole output of at least one of the mill's products, such as its cotton yarn, or its woven fabrics; their financing function is much more important than in the case of brokers and manufacturers' agents; they handle goods of the same kind for different mills;

[1] Adapted by permission from L. D. H. Weld, "Marketing Agencies between Manufacturer and Jobber," *Quarterly Journal of Economics*, XXXI (1917), 571–99.

they usually have more power in determining the price at which goods shall be sold than do the other two kinds of middlemen; they handle goods which are not usually branded and advertised; they receive their compensation in the form of a percentage commission on sales; they often perform the additional service (which may be considered a part of the selling functions) of furnishing designs for the mills, and telling them what fabrics and designs to run through the looms.

The distinguishing features of the manufacturers' agent, who is found in the hardware and grocery trades, appear to be as follows: They more commonly sell for their clients in a restricted, though fairly extensive, territory, so that a manufacturer may have two or more agents in different sections of the country—though there are exceptions to this, especially in the hardware trade; their financing function is unimportant as compared with commission houses, inasmuch as they rarely make advances to or otherwise finance manufacturers; they handle a variety of goods of the same general class, such as various kinds of hardware, but they sell each particular article for only one manufacturer; sometimes, especially in the grocery trade, they handle branded and advertised goods; similar to commission merchants, they usually receive their compensation in the form of a percentage commission, but sometimes they receive salaries or lump-sum annual payments, and not infrequently flat rates per package of goods sold; they usually have to follow the prices set by the mills, rather than enjoy the privileges of setting prices themselves.

The distinguishing features of brokers, at least as they appear in the grocery trade, are as follows: Their field of activity is more limited than in the case of commission houses and manufacturers' agents, since they frequently sell to jobbers only in the city where they are located; the "pure" broker does not represent any particular manufacturer, but places his orders from purchasers with any manufacturer whom he may select at the time (there is a tendency for so-called brokers to represent definite manufacturers in restricted markets); they usually have no financing function; they sell the same kind of goods for different manufacturers; they handle principally unadvertised goods; they usually receive flat rates per package or per carload, rather than a percentage compensation; they have very little leeway in determining prices, usually having to get them "confirmed" by manufacturers.

See also p. 367. Buying for Retail Hardware Stores.

7. THE USE MADE OF THE JOBBER[1]

What is a jobber? To the man on the street the jobber is a large, important commercial house, ranking in stability with the best institutions in the community. Its working capital is relatively large. Its credit rating is excellent. It is an institution whose whole business is to buy goods and re-sell them to retailers. It is a specialized organization for marketing—a sales organization first, last, and always. That is about as far as the average man's notion of a jobbing house goes.

But much more is involved in the work of the jobber that becomes apparent only with a closer view than most people are permitted. The jobber studies the consumer's needs of his trade territory, determines what the people will want, and then sets out months in advance of the actual demand to assemble the goods to satisfy the needs, drawing upon all parts of the world. Assembling the merchandise that people will want next season is an enormous social responsibility when you stop to think about it. A grocery jobber must secure from two thousand to five thousand items. He must buy from hundreds of producers, thousands in some cases. A superficial count of the countries of origin of the merchandise of a single jobbing concern showed that there were over thirty countries represented.

To care for these incoming goods, storage must be provided, warehouses that will keep the goods safely and free from deterioration of any kind, whether from weather, temperature, fire, dust, vermin, or what not. The jobber's warehouse is the source of supply of most retailers for most goods.

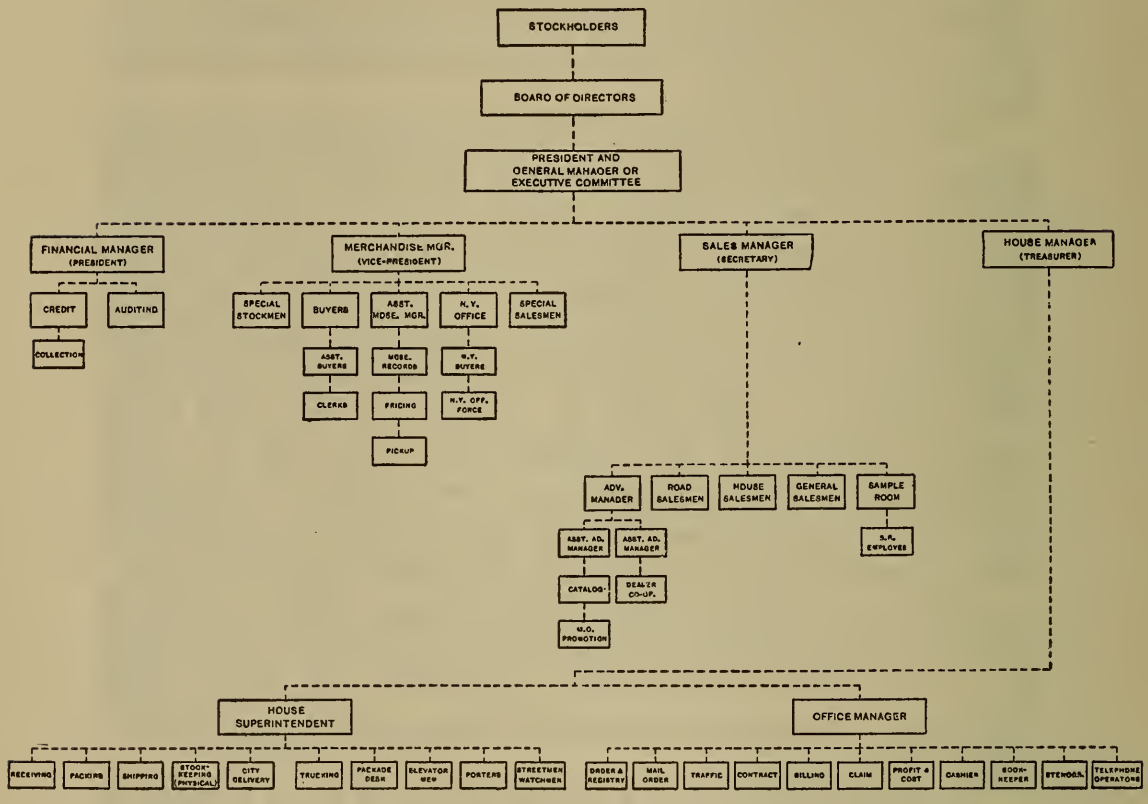
It should be kept in mind that the jobber of today is generally and essentially a local institution. Not many grocery jobbers can sell large volumes of goods more than a hundred miles away. The jobber's strong points of service are that he carries a large open stock, from which the retailers within a certain radius can order through salesmen, by mail and wire, and secure the goods in a few hours, that orders can be made up for practically everything the retailer wants, and in such quantity as desired.

The advantages of the jobber to the manufacturer or producer are obvious. Months in advance of consumption and in advance of the retailers' orders the jobber places his orders and thus relieves the manufacturer of watching the market and making his own studies

[1] Adapted by permission from P. H. Nystrom, "The Jobber's Indispensable Place in the Economic World," in the *Journal of Commerce* (July 9, 1917), 13–15.

of consumers' demand. A great many manufacturers are saved practically all selling expenses by selling their entire product to one or a few jobbers by contract for the season, year, or in large quantities at a stated time.

A POSSIBLE WHOLESALE ORGANIZATION[1]



Check this diagram with the marketing functions listed on page 262. Do the two agree? Do they coincide in plan?

It is easy to underestimate the value of and the necessity for salesmen. The mail-order exceptions merely prove the rule. Even government bonds cannot be sold without salesmen and sales organization. The jobber's salesman represents a large line of goods co-operatively handled. I have never heard of any manufacturer claiming that he could sell his product at a lower selling expense than the jobber.

[1] Taken from J. B. Swinney, *Merchandising*, p. 40. (Alexander Hamilton Institute, 1917.)

The credit man of a jobbing house performs a service in stabilizing business that is highly creditable. His knowledge of his customers extends to matters purely personal and of character in detail, as well as of business matters. He is able to judge with great precision how far the retailer may extend his business. If jobbers were to eliminate all of the trade with retailers who are classed as bad credit risks by some manufacturers, great hardship would ensue in many parts of the country. The line between success and failure is often finely drawn, but the skillful local jobber's credit man stands in much better position to discern it than the distant manufacturer's credit department.

Manufacturers who sell direct are merely developing complete jobbing organizations of their own, duplicating in detail what already exists. I do not say this is unnecessary. There are some lines of merchandise that require special organizations, but for the majority of lines and their manufacturers the jobbing system appears to serve very adequately.

That the wholesaler performs an economic service to the retailer is clearly evidenced by the fact that more than 80 per cent of the retail merchandise of the country is bought through jobbers. The jobber maintains a constant, open supply close at hand. Orders may be sent in at any time and for smaller quantities than manufacturers care to handle for the retailer. Orders can be made out for a large variety of goods and all will be filled from source of supply. One order for twenty-five items, instead of twenty-five orders, to as many manufacturers means a saving of time, postage, stationery, and accounting.

Transportation charges are reduced to a minimum. Both time and money are saved. Most jobbers fill practically all orders on the day they are received. Buying in small quantities of each item makes rapid turnover possible and consequent pro rata reduction of overhead expenses, resulting in higher profit per sale and each profit multiplied by the turnover. Manufacturers, as a rule, while making price concessions require the retailer to buy in larger amounts than the jobber. But what the retailer gains in price he sacrifices in higher overhead, shrinkage, and waste.

The small retailer must, of physical necessity, patronize a jobbing institution. If he were to buy all his goods from individual manufacturers he wouldn't have any time left in which to sell his goods. In dealing with manufacturers the retailer is required to pay out large sums of money, sometimes at inconvenient times, whereas

the jobber's times and terms of settlement are regular and may be easily provided for in advance.

There is another important function of the jobber, and that is the educational help given to the retailer. The jobber's salesman is frequently the teacher of the retailer, showing what the demand will be, how to prepare for it, what sales methods to use, and so on. This, without doubt, has been an important factor in the success of many retailers.

We may summarize the functions of the jobber to manufacturers, retailers, and to the public by stating that he is the specialist in distribution on a large scale. We need specialists in manufacturing. We need specialists in professions. We need specialists in every work. And we need specialists in marketing.

It should be obvious to anyone, with the facts concerning the work that jobbers actually do before him, to see clearly that the jobbing system, or some system very much like it, is absolutely necessary and is here to stay. His precise functions will vary from time to time as they do now from community to community and from line to line. But the study of market demand in a broad way, the assembling of merchandise in large quantities from the widest sources, months, and even seasons in advance of the actual demand, the redistribution of these products in such quantities as desired at the precise times when needed are functions that must be carried on some way and by someone.

8. LEADING RETAIL AGENCIES[1]

A large majority of the retail stores in the United States are what I prefer to call unit stores. Sometimes they are called "independent" stores or "regular" stores. A unit store is a store without an elaborate departmental organization that is owned and managed as an independent unit for the sale of goods through personal salesmanship. Unit stores are used most extensively for the distribution of merchandise such as groceries, hardware, agricultural implements, shoes, men's clothing and furnishings, jewelry, cigars and tobacco, and drugs.

Unit stores furnish the most numerous outlets for many kinds of merchandise. They provide the only means whereby large numbers of consumers can be reached regularly. They are adaptable to

[1] Adapted by permission from M. T. Copeland, "Scope and Content of a Course in Marketing," in *Journal of Political Economy*, XXVIII (1920), 375–98.

the service requirements of their patrons. Frequently the proprietor of a unit store has built up a strong personal clientèle. The market for merchandise distributed through unit stores is not dominated by a few large powerful buyers.

A manufacturer who elects to distribute his product through unit stores, however, encounters difficulty in inducing a large number of individual retailers to handle his product effectively. While there are many notable exceptions, nevertheless a considerable proportion of unit stores are not operated efficiently. The selection of this type of store as the marketing agency, therefore, presents a series of difficult, complex problems.

For some commodities a manufacturer finds it advantageous to select unit stores to act as exclusive agents. This policy is exemplified by several large clothing manufacturers. Other clothing manufacturers, whose product is probably of equal merit, follow the opposite policy of not building up a system of exclusive agencies. This is one of the large problems of sales policy, because there are substantial reasons for and against this system.

Another type of store that is generally operated on the unit principle is the company store. This has come into especial prominence during the last few years of rising prices. The American Woolen Company, for example, has recently established a store at its plant in Lawrence, Massachusetts, for the sale of merchandise to its employees. Similar stores have been organized by several other large employers of labor. To the manufacturer or wholesaler seeking distribution for his product, the company store presents a problem because of the doubt as to its permanency and the friction that it causes with many of the unit stores with which it competes.

The retail-wholesale store is another institution that complicates the sales problem for many a manufacturer. Such a store is one that carries on a retail business and also operates a wholesale department. A store of this type ordinarily demands wholesalers' discounts. It is, therefore, in a position to buy goods for its retail department at manufacturers' wholesale prices. It oftentimes becomes a troublesome competitor of the unit stores, to which the manufacturer cannot afford to sell at wholesale and which are forced to buy from wholesalers at prices higher than the wholesale-retail store purchases its merchandise.

The metropolitan specialty store, especially for articles such as women's wearing apparel, has become an important factor in the sale

of some kinds of merchandise. This type of store has operating expenses quite similar to those of the other types of stores with which it competes. Its main advantages appear to be those that accrue from specialization.

A department store, according to the customary usage of the term, is a retail store organized on a departmental system in which one of the large departments is dry goods. Wherein does the department store have its chief advantages? Its size frequently gives it a buying advantage. Oftentimes it is able to obtain wholesale prices or high discounts because of the large quantities that it purchases. Its size, however, does not give it any advantage apparently in operating expenses. From such scanty information as is now available it appears that the ratio of operating expenses to sales is as high in department stores as in unit stores. Frequently the expenses are higher in department stores in proportion to sales. Some of the failures of department stores during the last ten years have been due, I believe, to a mistaken theory that a large volume of business necessarily meant economy in operation.

The chief advantage of a department store, it seems to me, is the facilities that it offers for shopping. A department store is essentially a shopping institution. It is a strong factor in the trade in women's wearing apparel, for instance; but as a rule the department store has not been able to make a success of a grocery department. It cannot operate a grocery department ordinarily as cheaply as a unit store is operated. The buying habits of the consumers, furthermore, lead them to patronize unit stores for the bulk of their purchases of groceries.

A chain-store system is a group of scattered stores with single ownership and centralized management. Ordinarily a central warehouse is operated from which merchandise is distributed to the retail branches. The chain-store system has the advantages of large-scale buying and wide dispersal of the individual retail branches. It has facilitated the development of standardization of equipment and of methods of operation and management. Chain stores have been most successful in marketing those products that ordinarily are sold through unit stores. Chain stores are located at points where it is most convenient for their patrons to visit them.

While the chain store undoubtedly has definite advantages such as have been mentioned, it also is at a disadvantage in some respects in competition with unit stores. The chain-store system is less

flexible. It cannot readily adjust its services, such as delivery and credit, to meet the needs of the individual patrons. Moreover, the advantages that the chain-store system gains through centralized buying and standardization of management methods are offset, in part at least, by the necessity of operating a central warehouse and especially by the difficulty in securing managers who will take a keen personal interest in the conduct of these stores. Expenses must also be incurred for policing the branches: a system of frequent, close inspection is necessary in a chain-store system.

Inasmuch as many of the chain-store systems have cut prices, they are looked at askance by numerous manufacturers who believe that their main reliance must be placed upon unit stores. The friction between chain stores and unit stores has been a matter of grave concern to many a manufacturer during the last ten or fifteen years.

Occasionally a manufacturer decides that a system of manufacturer's retail branches is the logical outlet for at least a part of his merchandise. The establishment of retail branches by a manufacturer is not ordinarily, however, for the purpose of economy in expense of operation. It seems to have been the general experience of manufacturers who have established retail branches that they are not able to operate their stores more economically than the average unit store or department store is operated. Such branches generally have been established for other reasons. One of these reasons is to insure a steady, sure outlet for at least a portion of the manufacturer's product. There are also several instances in which manufacturers have established a small number of retail branches for educational and promotional work. Whenever a manufacturer decides to open up a retail store, he finds immediately that his action is capitalized by his competitors, who seek to develop a spirit of antagonism among retailers on the ground that the manufacturer is entering into direct competition with his own customers.

A mail-order house ordinarily is a business that sells at retail from catalogues and not over the counter. The orders are received by mail at a central warehouse whence the goods are shipped to consumers. The chief field for the development of mail-order sales has been in the rural districts and small towns. The catalogue of a mail-order house gives an opportunity for shopping somewhat akin to the visit to a department store. The large mail-order houses, to be sure, have utilized their buying power and their established

clientèle to sell many products outside the range of shopping goods. Whether a mail-order house is able to operate at substantially lower expense than unit stores is a question that has not yet been definitely settled. At all events, concentration of buying power and the tendency to cut prices frequently have caused manufacturers to hesitate to seek distribution of their products through mail-order houses.

Co-operative stores have not been sufficiently successful in the United States, up to the present time, to present a substantial marketing problem. A co-operative store, properly speaking, is one that is owned and managed by consumers. The typical co-operative store is organized on the Rochdale plan, whereby each member of the society purchases one or more shares of stock at a small amount per share. The number of shares that one member may hold usually is limited, and ordinarily each member has one vote irrespective of the number of shares of stock that he holds. Dividends are commonly paid upon the stock at the ordinary local rate of interest and the remainder of the earnings, aside from such as may be set aside for reserves or surplus, are distributed to the members annually in proportion to their purchases. This system has had a tremendous development in European countries, but in the United States the number of co-operative stores is small and many of those in existence have led a precarious life. During the last eighteen months [in 1919 and 1920], the co-operative movement has received a new impetus in this country through the influence of labor-union men; this may prove to be a new marketing factor of large significance.

Retail public markets present problems of quite a different character from those encountered in other types of retail stores. Municipal markets in which booths are leased to dealers, to be sure, are not far different from other classes of retail stores. Public markets in which producers sell to consumers, however, bring in a new set of problems.

Widespread efforts have been put forth, specially during recent years, in numerous localities to stimulate the development of public markets of this type. Their success depends upon the buying habits of the consumers and their readiness to go to those markets. Their success also depends upon the readiness of the farmers to spend the time necessary to haul their produce to market and to carry on its sale.

Wagon retailers include those merchants who do not operate a retail store, except perhaps as an incidental adjunct to their business,

but who retail merchandise from wagons that deliver the merchandise at the homes of the consumers. The milk trade is one of the notable examples of business that is carried on by wagon retailers. Suggestions, such as have been made from time to time, that a co-operative system should be used for milk delivery, run afoul of this fact, that the only place of business for the ordinary milk dealer is his delivery wagon. If he gives up his independent delivery system, he practically gives up the independence of his business.

The ice business is another trade carried on by wagon retailers. In this trade the heavy loss through shrinkage tends to discourage duplication of routes and therefore to result in the development of local monopolies in the ice trade.

The final class of retail merchants includes what I have termed bulk retailers. Examples of this class are coal merchants and lumber retailers. In these trades a merchant must necessarily carry a larger stock requiring a heavy investment of capital. The trade is seasonal and sales are usually made in bulk lots on specification. The individual consumer seldom visits the place of business of the retailer.

Each of these types of retail merchants presents special problems in store management and also special problems from the standpoint of the manufacturer or producer who undertakes to determine the logical channels for the distribution of his product. The selection of the retail channels to be used, moreover, influences the producer's decision as to the method of wholesale distribution to be utilized.

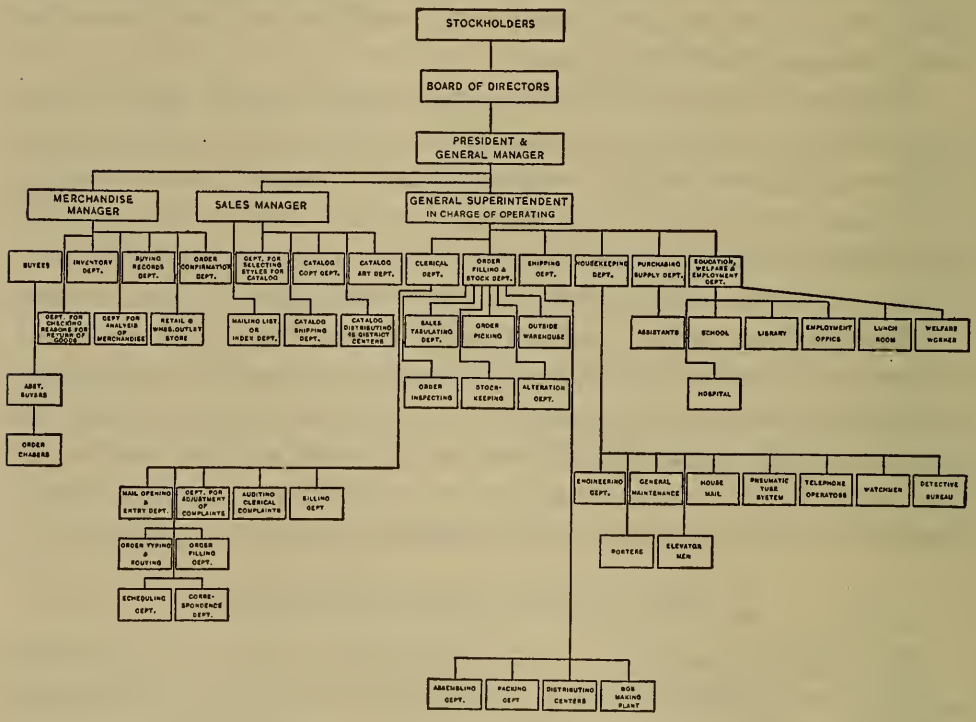
9. THE MAIL-ORDER BUSINESS[1]

The extent of mail sales. To perhaps the majority of people the mention of mail-order selling brings up the thought of enormous establishments, such as Sears, Roebuck and Company, Montgomery Ward and Company, and other strong houses doing a large business on a national scale. It is not strange that mail-order business now stands for big business in the popular mind. The success of some of the best known mail-order establishments has been so phenomenal that it has overshadowed in public thought the success of thousands of small houses. It is a mistake, however to think that mail-order selling is confined to a few great, well-known houses, or that the problem of mail-order competition for retail stores is one involving merely the activities of great corporations. There are many

[1] Adapted by permission from R. S. Butler, H. F. DeBower, and J. G. Jones, *Marketing Methods and Salesmanship*, pp. 63–66. (Alexander Hamilton Institute, 1914.)

thousands of prosperous houses doing business wholly or partly by mail. In the aggregate their business is tremendous. They are not spectacular in their methods, but their business is solid, steady, and growing, and they must be taken into consideration in any discussion of the problems and methods of mail-order selling. Mail-order selling is not centered in Chicago or New York; it is centered everywhere. There is scarcely a town in the country that does not make sales by mail.

ORGANIZATION CHART OF A MAIL-ORDER HOUSE[1]



Why goods are sold by mail. The causes of the development of mail-order marketing are many. One of them, and the greatest, is the growth in realization of the possibilities of advertising. Another is the rising standards of living, which result in a demand among country dwellers for many things that they cannot always buy in local stores. Still another cause is the great increase in the number of manufactured goods that crowd the shelves of retail stores. Heretofore almost any manufacturer could obtain dealer co-operation for his

[1] Taken by permission from J. B. Swinney, *Merchandising*, p. 322. (Alexander Hamilton Institute, 1917.)

products; nowadays the dealer is often averse to pushing new goods, and accordingly the manufacturer finds it necessary or expedient to seek his own market. His decision to do this is frequently induced, also, by the prospect of complicated problems likely to arise as a result of distribution through "regular" channels. Added to these causes are all the facts of strength inherent in the mail-order business. Mail-order selling, therefore, is partly the result of consumer demand, partly the result of the manufacturer's necessity, and partly the result of a marketing policy dictated by expediency.

10. THE LOCAL RETAILER'S ANSWER TO MAIL-ORDER COMPETITION[1]

[This selection is written from the point of view of the local druggist but it may be widely applied. The student would do well to prepare lists of the advantages of (*a*) the mail-order house and (*b*) the local retailer in this struggle. Which agency should a manufacturer use?]

Let us analyze this mail-order competition and discuss methods of meeting it. While mail-order competition is a menace to the retail trade, it does not succeed in taking away a great deal of business from the merchant who is energetic and aggressive. Mail-order competition should be an added incentive to work harder and to give customers more efficient service. While mail-order competition can be successfully met, it must not be underestimated. These concerns are competitors worthy of any merchant's best efforts. It takes the "cold steel" to make them give ground.

People are induced to purchase from catalog houses through the influence of catalogs, special price lists, and other advertising matter sent to them at frequent intervals. In a word, mail-order houses *create* business. They introduce goods in such a convincing manner that people are made to want them.

Prices are a strong point. They are quoted in such a manner that the prospective customer feels they are very low.

Illustrations in the catalog and other advertising material are, as a rule, good and the descriptions are written by men who know how to appeal to people.

Many are made to believe that they can purchase better goods and save money by ordering from the catalog house.

[1] Adapted by permission from the *Northwestern Druggist* (February, 1918).

The catalogs of the large houses list many items that local merchants do not carry in stock.

And last, but not least, is the *constant* and *persistent* sales effort, which counts.

The local druggist has many advantages over the catalog house:

1. He is acquainted with his customers; people do not know, however, with whom they are dealing when they purchase through the mail-order house.

2. The local merchant meets his customers face to face and can appeal to them personally; mail-order houses must put their appeal in cold type.

3. The customer has an opportunity to *examine* before purchasing; the mail-order houses can only show pictures.

4. The local druggist can make immediate delivery; he can also immediately make good his guaranty to refund money or exchange for other goods; the mail-order goods are subject to annoying delays and there are carriage charges to be paid; to exchange mail-order goods adds considerably to their cost.

5. The local druggist knows his customers and can extend credit when it is advisable to do so; mail-order houses necessarily require cash with the order, or the goods are shipped C.O.D.

I am firmly of the opinion that the average retailer in the average community can secure for himself a very large proportion of the business going to the mail-order houses from his town and the surrounding country by using mail-order methods, modified, of course, to suit local conditions, and going after the business aggressively.

1. Make your advertising effective. The mere insertion of a business card in a newspaper is not advertising. Advertise persistently and endeavor to have something of interest to say. Use modern merchandising methods. Display your merchandise attractively. Keep the stock orderly. Change your window displays frequently—and keep *smiling*. It is said that the large catalog houses find the towns, where merchants are indifferent advertisers not up to date in their methods, the most fruitful field.

2. Examine your own store. Keep your stock as complete as possible. Examine your service critically. If these are not all they should be—*clean house*. The average retailer can meet the mail-order competition at every point if he only *thinks* hard enough and *tries* hard enough. Read your pharmacy journals. They contain many ideas which will prove helpful in your fight against this compe-

tition. Be wide awake and on the lookout for new things and new selling ideas.

3. Arrange to get a copy of the catalogs issued by the mail-order houses. Study the goods and prices. They are like open books to one who desires to know how they secure their business.

4. Try to secure the co-operation of every merchant in your town, who all feel, more or less, the effect of this competition. Interest the publishers of your local papers.

5. Whenever necessary, sell from the catalogs of your wholesalers and manufacturers.

6. Fill mail orders promptly and treat the customer right—and always courteously.

7. Send circulars to the farmers telling them of special offers.

8. Offer to meet the catalog price of any article listed when the carriage charges are added to the price quoted. This may mean a loss in some cases but it is good advertising, and in most instances can be done at a profit.

9. Publish advertisements comparing mail-order prices with your own. Call attention to the annoyances and delays caused by the mail-order houses in sending wrong size, underweight packages, or seconds.

10. Telephone customers of special items which you think they may be interested in. Send out personal letters—and make them *personal.*

11. Lastly, keep hammering away month after month. This will get results.

11. SOME CHARACTERISTICS OF THE DEPARTMENT STORE[1]

According to the United States Census of 1910, there were 8,970 department-store merchants and 88,059 general store dealers in this country. C. C. Parlin stated in 1913 that there were 1,140 department stores in the country, each of whose sales averaged over $200,000 annually, and he estimated that fully 40 per cent of the dry-goods and ready-to-wear goods of the country were marketed through these 1,140 stores.

[1] Adapted by permission from P. H. Nystrom, *The Economics of Retailing,* pp. 197–206. (The Ronald Press Company, 1915.)

The characteristic things about department-store merchandising are:

First.—Many departments or sections under one roof. Stores are not usually classed as department stores unless they have at least a score of departments and from this number to a hundred or more. One of the largest is said to have over 250 sections or departments.

Second.—Special conveniences offered to all shoppers whether they buy or not. Under the guise of "service" the modern department store has come to be a sort of club house and amusement place for women. One ordinarily finds in these stores rest rooms, silence rooms for nerve-tired shoppers, reading and writing rooms, restaurants, information bureaus, post offices, telephone booths, and telegraph stations for the unrestricted use of all. In some stores lectures, demonstrations, musical programs, moving picture shows, and even operas and plays are given frequently. In a few cases, the department store has served as an employment agency for domestic help, as a house and estate agency, and even, recently, as a market for corporation securities. Some department stores conduct banking departments accepting the deposits of their customers and employees and paying interest on these deposits, although this form of service is now somewhat under a cloud because of the recent failures of large eastern department stores having banking departments. Hair dressing and manicure parlors, and children's barber shops are regular adjuncts of the largest stores in all cities. Play rooms for children, lost and found departments, and dental parlors are also common. None of these services have any direct connection with the sale of goods in the store.

Several special forms of service in direct connection with the sale of goods are also common. Free delivery, sales on credit, C.O.D. sales, goods sent to the homes of customers on approval, guarantee of "money back if not satisfied" and "goods freely exchanged," are so common now as to merit no more than a remark. While many of these services are extended to their customers by specialty or one-line stores, none have gone farther than the big department stores, and none could profitably do so.

Third.—The employment of specialists in the advertising department. The great volume of advertising run by the larger stores is intended to draw people to the store and to facilitate the sale of goods. It is intended to take the place of much of the expert salesmanship

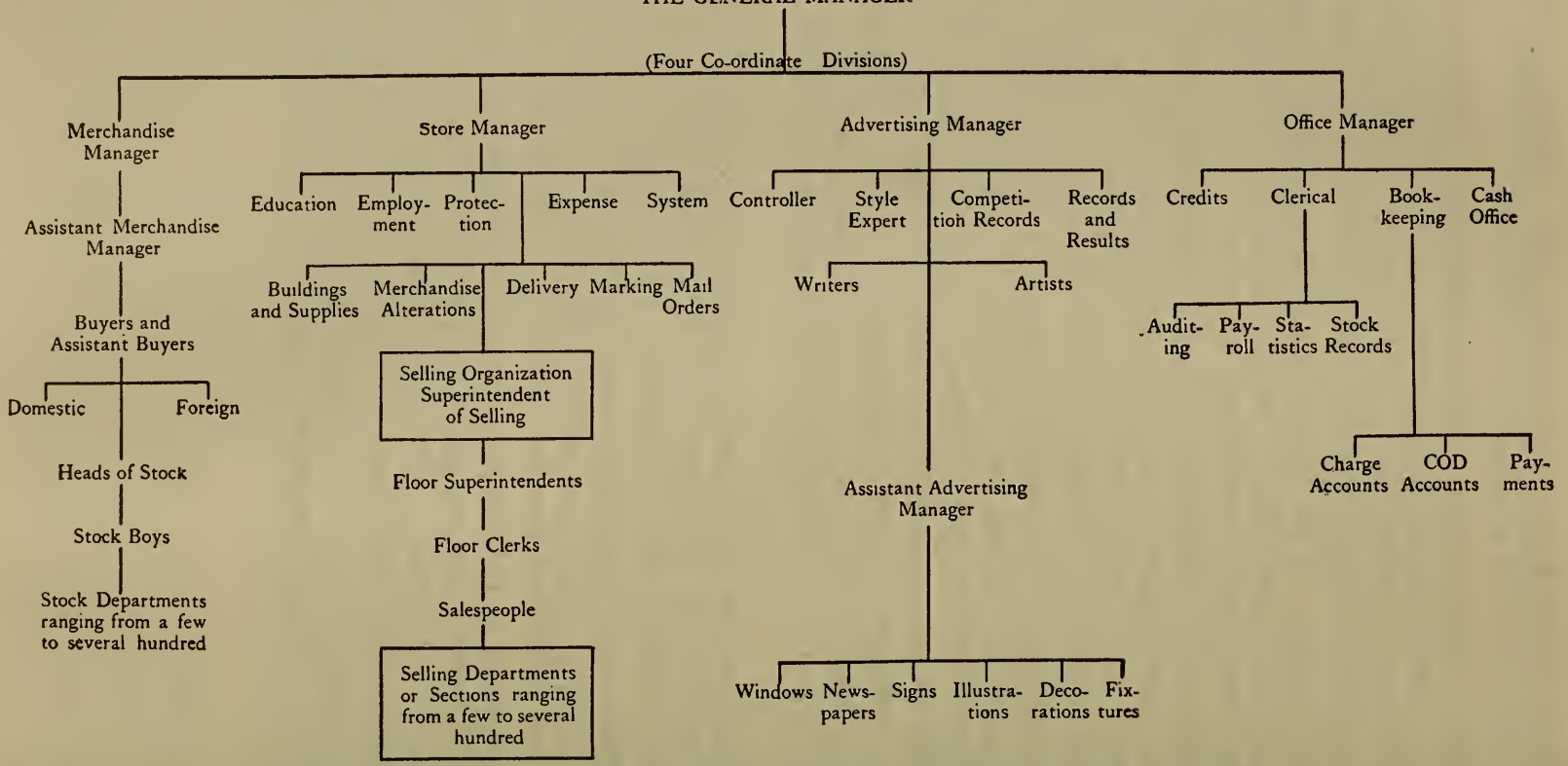
that might otherwise be necessary to effect sales. Department stores are the greatest users of newspaper advertising space.

Fourth.—The main factor of department store efficiency apart from its buying and advertising powers, already referred to, is its specialized form of organization. In this respect the modern department store differs as day differs from night from the old time general merchandise store. In the latter, there was no specialized organization. Clerks sold goods in all or nearly all departments, and accounts or records were not separately kept. For the most part, when the store made a profit, the owner could only guess what lines of goods produced it, and his guess was as likely to be wrong as right. Possibly department store system would be impracticable in the general merchandise store, but the lack of it was the weakness of the latter, and the presence of it the basis of the peculiar strength of the former.

In a department store, each department or section is considered as a separate specialty store or shop. Its accounts are kept separate, and under normal conditions it must stand on its own feet; that is to say, it must pay its own expenses, and its prorated share of the general expenditure for rent, light, heat, power, insurance, office up-keep, and so on. In addition to this it must seek to make a net profit.

Each department has its own organization for buying and selling goods, consisting in the former case of its manager or buyer and necessary assistants such as assistant, buyer, head of stock, and sales people. In these respects the department is exactly like a specialty store, but the accounting, advertising, stockroom work, credits and collections, handling of the cash paid out and received, and the delivery of the goods is done for the individual department by special departments organized to serve all of the merchandise departments in the store. The specialty store, selling one line, has its own accounting, advertising, credit cash and delivery departments, but in a department store of forty sections, for example, there is but one of each of these departments to serve all of the forty sections.

ORGANIZATION CHART FOR A DEPARTMENT STORE[1]



Compare this diagram with the ones on pages 280 and 288. Are there basic differences?

[1] Taken from *The Department Store*, The Vocation Bureau of Boston (1912).

12. THE MANUFACTURER AND THE DEPARTMENT STORE[1]

[It is rather widely claimed that a manufacturer prefers to sell to a department store because of the greater commercial stability of such a store and greater certainty concerning the amount of output which will be taken. This selection shows that the manufacturer has other things to think over.]

Right at the start of any discussion of the relations of manufacturers of branded goods and the big stores, it is necessary to point out a very real conflict of interests. It is all very well, and very true, to tell the small dealer in groceries or drugs or notions that his interests and the manufacturers' interests coincide, because he can sell nationally advertised goods so much more easily and more cheaply. The good will inherent in the manufacturer's brand is an asset to the small dealer, and he can afford to cultivate it. But in the case of the large store, it doesn't work that way.

To sum it up briefly, there is a real conflict between the interests of the manufacturer and the interests of the big store. Manufacturers' good will injures the big store more than it helps, because it draws possible purchasers away from the store brands, while the big stores' good will hurts the manufacturer in ways which are perfectly obvious.

As a matter of fact, department stores do carry most advertised lines, but do not make any effort to sell them. In fact, the effort is usually the other way especially where the goods are of such a nature that the element of personal service enters into the sale of them. A woman going into a corset department and asking for a nationally advertised brand of corset at a dollar and a half would probably get exactly what she asked for. But if she asked for a five- or ten-dollar corset—the purchase of which usually involves fitting—the saleswoman would lay out a specimen of the brand called for, and also of the store's private brand. The brand asked for would be tried on first, but the private-brand corset is likely to be so comfortable under the skilled fingers of the fitter that the customer changes her mind.

Some of the corset manufacturers have gotten around this difficulty by having representatives do the fitting in the store, hired and paid for by the manufacturer, but acting under the direction of

[1] Adapted by permission from R. W. Johnson, "The Big Store and Advertised Goods," in *Printers' Ink* (October 31, 1912), 59–62.

the store as extra saleswomen. In some cases this practice has gotten almost to the point where the manufacturers are hiring all the help in the store corset department, and they point to this as another phase of the department-store problem. A demonstrator for a month or so is all right, they say, but when it comes to hiring permanent saleswomen for somebody else it ceases to be a joke.

A great many manufacturers would be interested in hearing from some of the stores on this subject. It is a subject upon which the manufacturers themselves do not care to speak out, because they do not want to risk offending some of their largest customers. Investigations among the large stores show that from 60 to 80 per cent of them express themselves as "friendly to" or "in favor of" nationally advertised goods. The manufacturers do not deny that. They say that the stores are friendly enough, and most of them are willing to carry a small stock of the goods, but they don't seem anxious to hand them out *unless* they are demanded.

Can anybody suggest a scheme whereby the manufacturer and the big store can line up their interests together, instead of playing at cross-purposes?

13. THE ORIGINS OF THE CHAIN STORE[1]

Chain-store systems may be classified according to ownership as follows: Retailers' chains, jobbers' chains, manufacturers' chains.

Retailers' chains have in many cases been formed simply by gradual expansion, the owner beginning with one store and adding others as circumstances permitted. Many retailers have been so successful with their first store that they have established branches, sometimes conducted in co-operation with the parent store and sometimes independently. In a few noteworthy instances retailers' chains have been formed by the establishment of a corporation with the purpose of acquiring and conducting a number of retail stores under a definite chain-store plan of organization. In still other cases chains have been formed by the union of several retailers into an organization, usually of corporate form, each retailer taking stock in the company, and in return permitting his store to pass into the new organization. Some of these retailers' co-operative chains have enormous memberships.

The object in view in the organization of retailers' chain-store systems has been largely to reap the profits of increased buying

[1] Adapted by permission from P. H. Nystrom, *The Economics of Retailing*, pp. 216–223. (The Ronald Press Company, 1915.)

power, of heightened efficiency in advertising, in better handling of credits and collecting, and in more profitable methods in handling and selling merchandise. For many merchants who have acquired or established branch stores, the additional store units have served as a means of investment for surplus funds and as a field for the exercise of exclusive ability not fully taken up in the single institution.

Some of the chain-store systems carry on their jobbing functions much the same as an ordinary jobbing house.

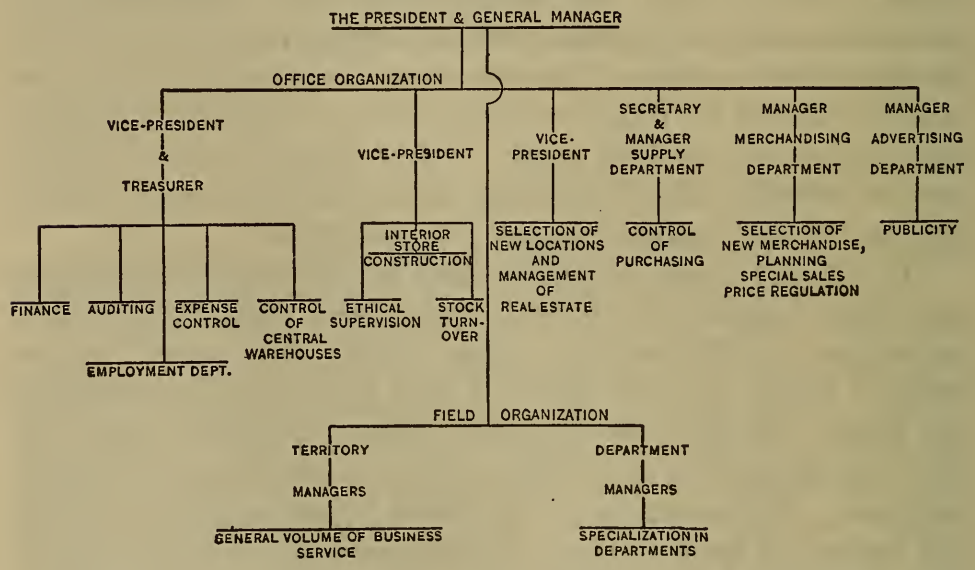
Jobbers' chains have come into existence in various ways. In some cases, jobbers have been forced to buy out retail stores from certain of their retail debtors to save themselves from loss such as would occur if the store were to go on in the hands of the former owners and managers. A good many jobbing houses have a number of retail stores that they virtually own and which they are nursing along in the hope of building up the business or until a competent manager can be found who will buy the store. Management of these stores calls for the same methods and practices as are required in other chain systems. In some cases when breaking into new territory, jobbers are forced to acquire stores of their own in order to find local outlets for their goods. Stores already in such localities may not willingly take on new lines, and a jobbers' own store system may be the only means of reaching the consumer.

In still other cases, the jobber may find his trade slipping from him either because of cut-throat competition with other jobbers, or because manufacturers are selling directly to retailers. In the ordinary course of events either of these processes might eliminate the jobber. To save himself and to insure a constant market, his only recourse may be to establish a chain of retail stores to handle his goods. This adaptation of the jobber to new conditions is going still farther in a few instances. Not only are chains of stores acquired but also manufacturing plants, so as to assure both a market and a product to place on the market. Jobbers thus have become both retailers and manufacturers, as well as wholesalers. It seems likely that this integration of distributive processes is likely to go on in several lines, those, particularly, in which the jobbing functions are diminishing in importance.

There are a number of manufacturers' chain-store systems, nearly all of which had their origin in an inability to find a satisfactory market through the regular channels of trade. Among the lines of goods represented in manufacturers chains, one finds several brands of shoes, confectionery, baked goods, hats, gasoline, and kerosene,

sewing machines, cash registers, adding machines, typewriters, office furniture, automobile supplies, corsets, gloves, sporting goods, phonographs, paper novelties, etc. Some of these goods probably could not be marketed through regular retail stores. Others are not so marketed because of dissatisfaction due to any one of several causes, such as competition with other goods on dealers' shelves; price-cutting among dealers on the manufacturer's standardized lines; inability of the average retailer and retail salesman to give intelligent salesmanship to the line; unwillingness of the average retailer to put in a complete line such as the manufacturer considers necessary to give the consumer a fair idea of his goods; and unwillingness or inability of the average retailer to give the additional service sometimes found necessary to make sales stick.

ORGANIZATION CHART OF THE LIGGETT-RIKER-HEGEMAN DRUG STORES[1]



Compare this diagram with the one showing a possible organization of a mail-order house (p. 288). Are there fundamental differences? Does this diagram fit in with the one on page 15?

There is another type of chain-store organization that might properly be discussed under this heading. This is the consumers' co-operative chains. Such concerns have not as yet made much progress in this country, but in Europe they are numerous and, according to most reports, very successful.

[1] Taken by permission from J. B. Swinney, *Merchandising*, p. 305. (Alexander Hamilton Institute, 1917.)

14. MARKET STRUCTURES BY CLASSES OF COMMODITIES[1]

[We are so prone to seek the *one* "right" way to do things in this world that this selection which points out that market structures are likely to vary with varying conditions will help us to keep a sense of perspective in the marketing field.]

One class of merchandise which seems to have common characteristics is raw material, or, more strictly, material whose disappearance from commerce takes the form of sale to a manufacturer for change into some other form of goods. (Class A.)

A second class of merchandise, which has some points in common with this, but enough points of difference to justify separate classification, is found in the case of such materials as still remain in existence and use as part of productive equipment after they disappear from commerce. (Class B.)

The class of merchandise which offers the most complicated marketing problems, however, is that type of goods which disappears from commerce to go into individual consumption, or into household use. (Class C.)

Class A—Having recognized such a classification of merchandise, it becomes necessary to examine the prevailing types of marketing functions in various industries and trades to determine their general nature and contrasting features in the light of this classification. A marketing transaction in the case of merchandise sold to be remanufactured is ordinarily conducted on a relatively large scale. Moreover, it is necessarily only one of a number of kindred transactions by which the supply of material is kept up. For example, if a blast furnace company buys iron ore, it presumably will buy it in quantities which under modern blast furnace practice will be relatively large, and it is also a safe assumption that it will buy iron ore more or less continuously as long as the blast furnace remains in operation. The large scale and the continuity of this sort of transaction is a common characteristic of purchase of merchandise for manufacture or remanufacture. The most common device to be found in this field of marketing is the contract (frequently of a renewable character) which has practically all of the terms and conditions standardized, leaving only the price and the conditions of delivery to be determined. In the case of mineral products not yet mined, it is not

[1] Adapted by permission from P. T. Cherington, *The Elements of Marketing*, pp. 20–55. (The Macmillan Company, 1920.)

uncommon for this type of contract to take the form of an agreement on a lease and royalty basis under which frequently the purchaser of the ore becomes either virtually or actually the operator of the mine. In this class of marketing transaction, the relation between the producer and consumer is intimate as well as continuous, and the connections thus formed may become an important part of the resources of the concern doing the purchasing. The ore contracts of the United States Steel Corporation are a case in point. If one were seeking for the underlying cause of a substantial part of the movement toward the integration or common ownership of successive steps in manufacturing industries in this country in recent years, he could find it in many cases in some of these typical contract relations.

The inherent properties of the commodities sold determine in a large measure the nature of the mechanism set up for permitting the influences of supply and demand to have free play. For example, the physical properties of wheat make it particularly favorable for handling through a highly organized system of storage and trading, which results in the entire supply being virtually in sight at all times, and which also causes most of the transactions taking place in it to be conducted on contract. Cotton, on the other hand, because of the lack of ease, from a physical point of view, with which it may be put into storage and taken from it, has developed an entirely different group of relations between the speculative trading, and spot trading. Similarly, such commodities as tobacco, sugar beets, and, to a certain extent, wool are incapable of accurate grading for future contract trading on a basis similar to that employed in the case of either wheat or cotton. They are, therefore, more often bought in either specific lots or by type. Cotton yarn furnishes an example of another commodity for manufacture which is bought and sold on conformity to type rather than either by the sort of contract prevailing in the sale of wheat and cotton or even by specific lots. Coal and iron ore, on the other hand, when bought at the mine, or more specifically in the mine, call for an entirely different method of reconciling the inequalities between production and consumption. The typical form of sale in the case of these is by the lease and royalty contract.

The characteristic features of the commercial mechanism for conducting such transactions in merchandise of Class A are comparatively simple. They are in most cases devices whose underlying task it is to guarantee as far as possible the free play of the price-

making influences of supply and demand. A mere listing of the type of marketing device commonly employed in this type of sale serves to make clear the comparative simplicity of this underlying task. Some of the more conspicuous devices are as follows:

1. Brokers
2. Commission houses
3. Merchants
4. Elevators, warehouses, and other storage equipment
5. Bankers
6. Underwriters
7. Auctions
8. Future trading facilities
9. Lease and royalty contracts

Class B—There is a very different general kind of marketing transaction in the sale of merchandise for the equipment of various enterprises both large and small. In the case of the larger types, such as the sale of railroad material and equipment, many kinds of machinery, and other kindred commodities, the transactions are on such a large scale as to affect materially relations of a financial nature between buyer and seller. A common solution in the case of marketing enterprises of this kind, as well as in the case of many articles for remanufacture, is the use of a contract by means of which all adjustments of the problems of quantity, quality, time, and place are stipulated in the agreement. This form of sale and the resulting relations between the buyer and the seller, based as they are upon a divergence between the nature of the business of one party to the transaction and that of the other, has caused frequently the setting up of what are known as "interlocking directorates" as distinct from the actual integration of ownership of both the buying and selling concerns. In this way a continuance of friendly relations is assured while organic separation is maintained.

Aside from the large volume of direct sale for merchandise of this class, there is a substantial volume of business conducted through a commercial mechanism. Jobbing contractors, such as are to be found in the sale of many lines of railway equipment, both steam and electric, are perhaps on a dividing line between direct sale and sale through mechanism. Supply houses, such as exist in many parts of the electric trade, or in the trades of building materials, and more completely standardized forms of machinery are clearly middlemen and therefore of the nature of a commercial device. In the case of

the manufacturers of equipment highly protected by patents, and particularly when the equipment calls for expert knowledge for keeping it up and special facilities for repairs, the providing of spare parts, and of supplies, the tendency has been to set up special selling organizations which are either actually or nominally operated independently of the actual producing process. Cases in point are the Western Electric Company, engaged in the distribution of telephone equipment, the sales departments of certain of the typewriter companies, and the distributing organization of various makers of machinery, such as printing or textile machinery.

Class C—Marketing of the remaining and most conspicuous class covers merchandise for individual or household use, and therefore includes the greater part of business terminating in a retail sale. In this class of marketing, in addition to the elementary problems common to both of the other classes, the process of distribution necessarily involves a large amount of emphasis on what have been referred to as the sales functions. The most conspicuous feature of the sales undertakings of this type is the comparatively small size of the sales unit in which the merchandise is disposed of in the final transaction. If there is a series of wholesale dealings leading up to this final transaction, each of these in a large measure takes its character from the fact that eventually the goods are to be offered to the consuming public in finely divided units. For merchandise of this kind there is inevitably some point in the course of the progress of the goods from producer to consumer up to which it is desirable to handle the goods in large quantities and beyond which it becomes advisable constantly to decrease the quantities in which the merchandise is moved through succeeding marketing steps. In the case of this class of merchandise another factor of great importance is the individual nature of the final sale. In such a sale there is an element of special selection or choice; hence, the physical conditions under which the sale is made become a conspicuous feature of this final transaction.

It is in this class that there are to be found most of the generally discussed efforts to change the organization of the distributing mechanism. Suffice it to say here that with the elaboration of activities in this class the devices for effecting distribution have become heavily incrusted with features which, while not economically justifiable for all types of customers, have real value to some of them.

It is only in very recent years that the efforts to free the distributing system in this class of some of its costly superfluities has taken really constructive form. The blind efforts to "eliminate" some "middleman" seldom have yielded the good results hoped for. The better selection and adaptation of the supplementary services rendered to the needs of various types of customers have accomplished real savings. New forms of mechanism are emerging. The old types of organization are being materially modified. The old terms "wholesaler" and "retailer" now find themselves qualified and subdivided; and the changes in the main, reflect a closer adaptation of forms of functionary to functions performed.

15. THE MIDDLEMAN IN DISTRIBUTION[1]

The middleman is a by-product of a complex industrial organization. Chart I shows in rough outline the evolution of the middleman from the early period, when producer dealt directly with consumer, to the appearance of the orthodox type of distribution (late in the eighteenth century and in the first quarter of the nineteenth century), when a complicated series of middlemen existed. It should be noted that this chart represents the typical case of the domestic product rather than that of imported commodities.

Just as the long period of development from a system of barter economy to the early decades of the factory system showed a continuous tendency for increase in the number of middlemen intervening between the producer and the consumer, so recent years have shown a growing tendency to decrease the number of successive steps in distribution. The tendency is apparent in nearly every industry and has been clearly marked in recent years.

Under the orthodox type of distribution, with numerous middlemen intervening between the producer and the consumer, the producer is in a position of disadvantage. The fixed charges under which he operates render it necessary that he operate continuously. The outlet for his goods, however, is controlled by the middlemen. Hence the middleman is able to exert pressure upon the producer and force a narrowing of his margin of profit. To free themselves from this pressure, the stronger merchant-producers seek to go around the immediate middlemen, thus decreasing the number of steps in the system of distribution.

[1] Adapted by permission from A. W. Shaw, "Some Problems in Market Distribution," in the *Quarterly Journal of Economics*, XXVI (1912), 725–31. Later published in *An Approach to Business Problems* (A. W. Shaw Company, 1916).

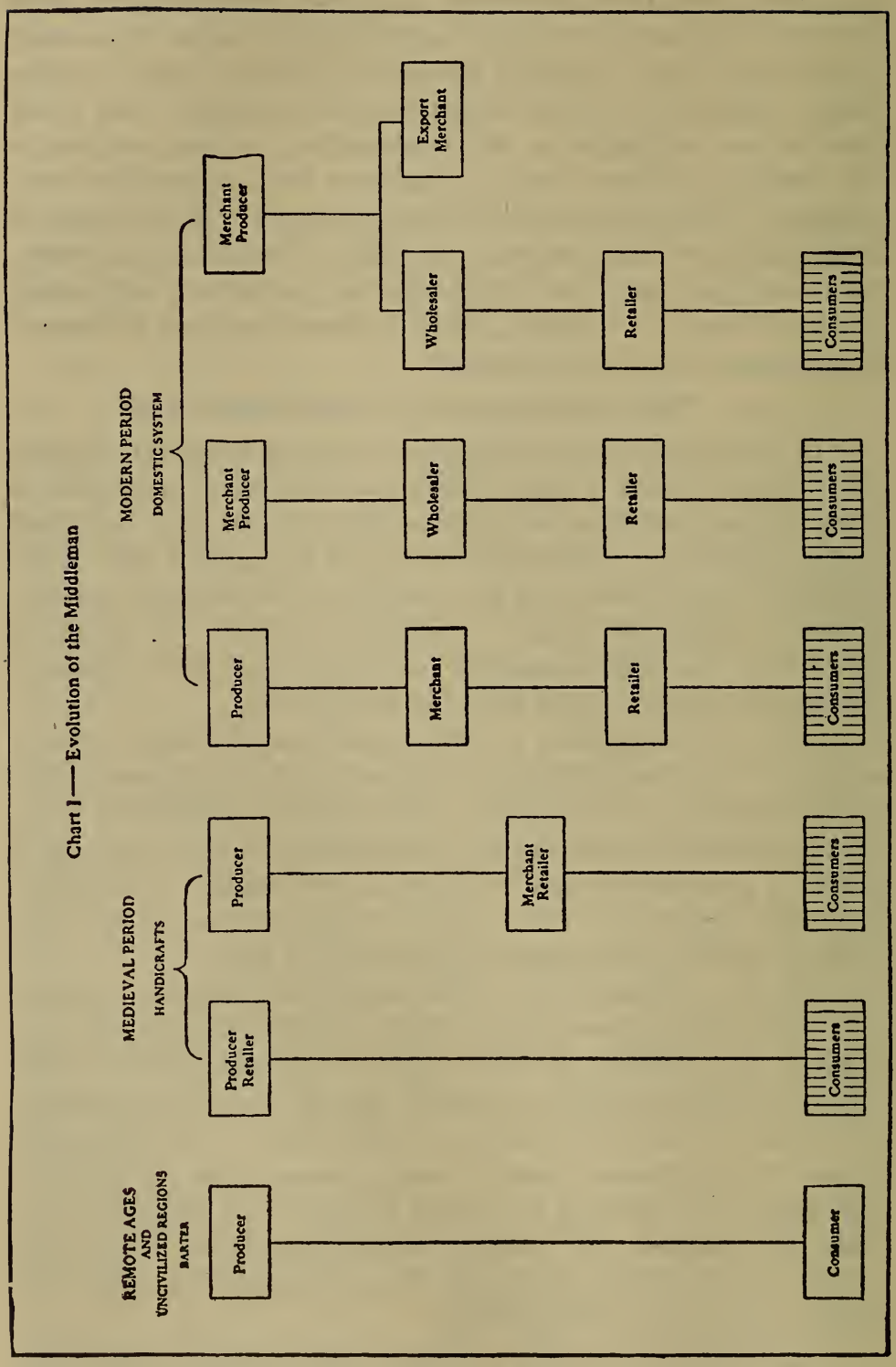


Chart I — Evolution of the Middleman
REMOTE AGES AND UNCIVILIZED REGIONS
BARTER
Producer
Consumer
MEDIEVAL PERIOD
HANDICRAFTS
Producer Retailer
Consumers
Producer
Merchant Retailer
Consumers
MODERN PERIOD
DOMESTIC SYSTEM
Producer
Merchant
Retailer
Consumers
Merchant Producer
Wholesaler
Retailer
Consumers
Merchant Producer
Export Merchant
Wholesaler
Retailer
Consumers

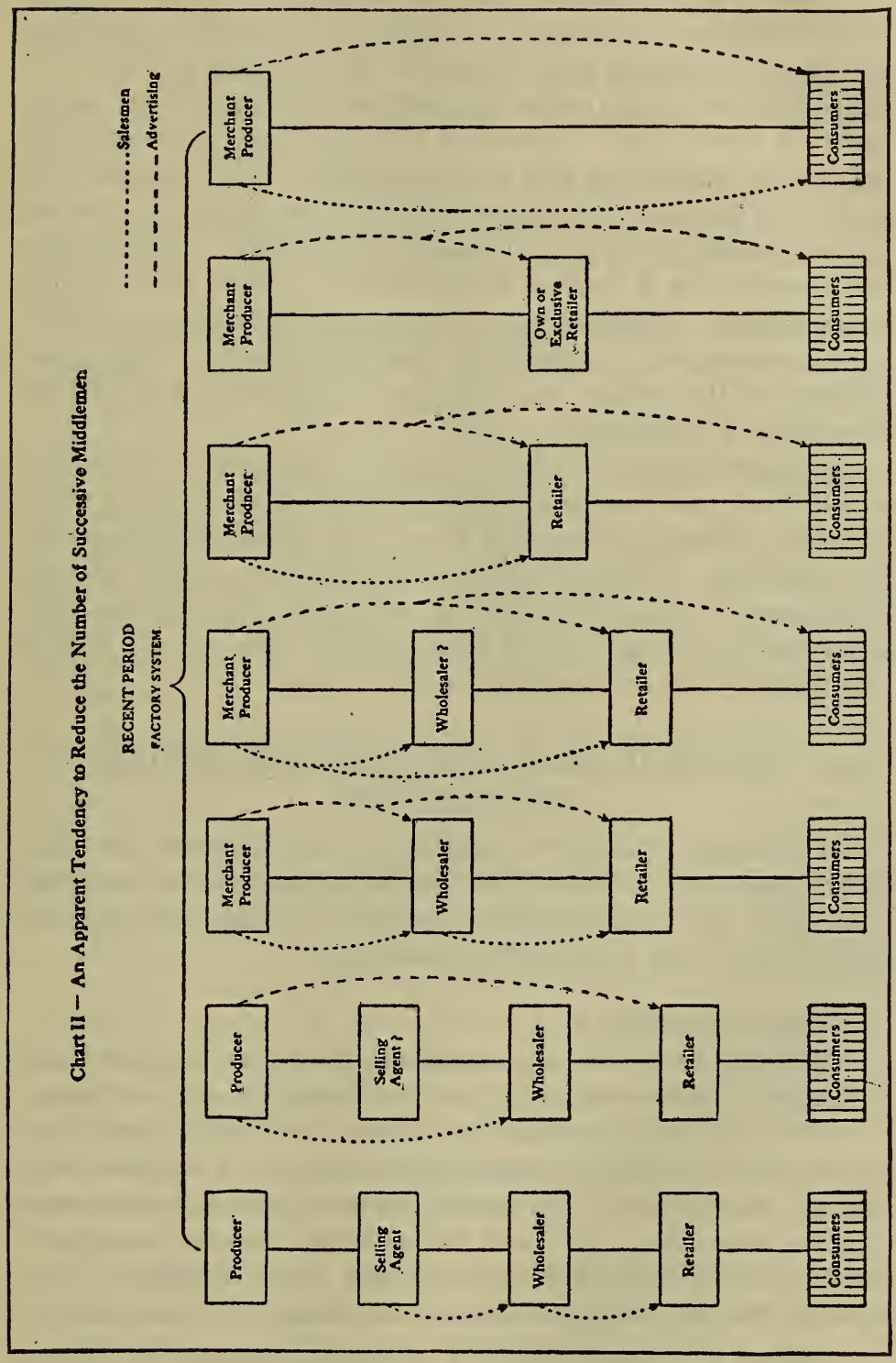


Chart II — An Apparent Tendency to Reduce the Number of Successive Middlemen
RECENT PERIOD
FACTORY SYSTEM
Salesmen
Advertising
Producer
Selling Agent
Wholesaler
Retailer
Consumers
Producer
Selling Agent ?
Wholesaler
Retailer
Consumers
Merchant Producer
Wholesaler
Retailer
Consumers
Merchant Producer
Wholesaler ?
Retailer
Consumers
Merchant Producer
Retailer
Consumers
Merchant Producer
Own or Exclusive Retailer
Consumers
Merchant Producer
Consumers

Chart II is an attempt to show diagrammatically the development of this tendency to decrease the number of successive middlemen. By the use of salesmen going directly to the wholesaler and by advertising directed to the retailer the producer has displaced the selling agent in many cases. Sometimes the advertising is directed not only to the retailers but also to the wholesalers. To strengthen still farther his position the producer will often use advertising directed to the consumer to build up a demand for his product. This involves the necessity for a product differentiated by trade mark, brand, or trade name. When the producer thus directly builds up a demand among consumers, he often takes the further step of sending his salesmen to the retailer, thus omitting the wholesaler entirely from his system of distribution.

The most extreme step in the process is the complete elimination of middlemen, and the sale direct from the merchant-producer to the consumer, either by advertising alone or by salesmen supplemented by advertising. Manufacturers of specialties have largely adopted this scheme of distribution and the enormous growth of the mail-order business in recent years gives evidence that in some lines of distribution there are economies in this system.

16. THE BREAK UP OF THE ORTHODOX SYSTEM OF DISTRIBUTION[1]

[The so-called "chaos" in modern distribution is well illustrated by this selection. It shows how "the second phase of the industrial revolution" is a "commercial revolution" in which the battle cry seems to be "Keep a grip on the consumer."]

What is the trouble?

Ask this question of the manufacturer, the jobber, and the retailer successively and you ascertain that the "other fellow is to blame."

"If," says the manufacturer, "Jones, the jobber, hadn't put out his private brand in competition with mine, I wouldn't have had any fault to find. He's pushing his own goods and at the same time handling mine. He won't let me know where my own goods are for sale, for fear I'll go over his head to the retailers. Consequently, between inability to stimulate and help my dealers, and the

[1] Adapted by permission from P. T. Cherington, *Advertising as a Business Force*, pp. 30–35, 157–204. (Doubleday, Page and Company, 1913. Copyright by Associated Advertising Clubs of America.)

jobber naturally pushing his own brand in preference, I'm up a tree, and I'll go direct to the retailer, if he doesn't come to time."

"If," says the jobber, "Martin, the manufacturer, hadn't cut me out and gone over my head direct to the retailer, I wouldn't have put out my private brand."

"If," says the retailer, "Jones, the jobber, hadn't gone also into the retailing business, I'd not have accepted the direct prices of the manufacturer and wouldn't have gone into the field of wholesaling, too."

The jobber, the manufacturer, and the retailer are interchanging functions. Park & Tilford are retailers, with a chain of stores, as well as jobbers. Francis H. Leggett & Co., of New York, are becoming advertising manufacturers of Premier products, as well as jobbers. Here are two jobbers reaching both ways, causing dissatisfaction to the manufacturer and the retailer alike.

The manufacturer, in order to have a finger in the messing up of the situation, has been known, not only to go over the jobber to the retailer, but also to jump at once to the consumer. An example is Browning, King & Co., clothing manufacturers and retailers, in fifteen cities.

Of course, the retailer couldn't stand all of this meekly. So we see in the James Butler string of grocery stores a retailer who demands jobbers' prices of the manufacturer and who is even doing some of his own manufacturing. Marshall Field & Co., of Chicago, do a large jobbing business. Wanamaker's, of New York, has just organized a wholesale department. All these were at first retailers.

If James Butler can buy groceries direct from the manufacturer at jobber's discounts, how can the little retailer on the corner, who is strictly minding his own business as retailer, possibly compete? Butler can sell his goods at prices that are "cost" to the little fellow. And the little fellow must live. He, therefore, is doing his part in stirring up the dust, and by association with other little fellows, putting himself on even buying terms with Butler. Those department stores that get jobbers' discounts are also regarded as just as full of threat to the retailers' business.

For their part such enterprises as those of Butler grit their teeth, and mutter something about "competition of jobbers" and "survival of the fittest." Indeed, the department stores, Butler, *et al.*, insist that they must have the jobbers' discount or they can't do business in competition with the retailing jobber. Macy's, or Saks's, or

Marshall Field's, or the May department stores seem to have some justification in their explanation in view of the invasion of the retail field by the powerful H. B. Claflin interests.

The whole mix-up has been caused by the attempt of some manufacturer or wholesaler to cut out one or more steps in the old-time distributive process, which was from manufacturer to jobber, to retailer, to consumer. The consumer holds the key—he will buy where he can get the best goods cheapest. While this tendency is one of the most natural in the world, it has developed strife and ill-feeling to a remarkable degree. Caught in the swirl of changing trade currents, every factor concerned has at times turned upon another, accusing it of being at the bottom of the whole trouble.

C. Sales Management for a Manufacturing Business

Now that we have at least a working hypothesis of what the marketing functions are and have seen something of the institutional life which can be used in the marketing process, let us examine in broad outline the control problem of the sales manager of a manufacturing business. Since we are more interested in similarities than in differences of marketing problems, it will facilitate our study if we do not designate what kind of a manufacturing business it is, beyond saying that it makes some commodity for individual, and not factory, consumption. We make this specification because the study we made of market structures dealt mainly with those concerned with the marketing of such commodities.

The problem may be put before us thus: a sales manager is considering how (and whether) to increase his sales in a certain territory which he is already "covering." What are the materials for the solution of this problem?

It must be admitted that the materials are none too abundant. We do not know as much about marketing as we do about the production activities of business. The reason is simple and plain. We have behind us more than one hundred years of study of production problems during a time when the market was ever yawning for more output. This study, too, was on a reasonably firm foundation of science, for the physical sciences which are applied in technology got their start on a modern basis as early as the seventeenth century. Marketing problems, in the contrary, have become, pressing only in the last generation or two and the basic sciences of psychology and economics are even yet not well developed.

This does not mean, however, that our sales manager is limited to pure trial-and-error experimentation or, worse still, that he is committed to stagnation. A beginning has at least been made in blocking out the main aspects of the problem. One such attempt is sketched on page 6 of this book and is explained at length in Shaw, *An Approach to Business Problems*. To Shaw, the work of the sales manager may be summed up in two expressions, (1) demand creation and (2) physical supply of the goods. The manager's activities are all in terms of those goals. This formulation is at least definite and tangible. Another formulation, that of Professor Copeland, is given in Selection 17 below.

And we are able to go farther than merely making a sketch of the outlines of the problem. Certain helps, some of them empirical rather than scientific, it is true, are available in the actual conduct of operations. There are certain "check lists" of forms or methods of analysis of the product, the market, and channels of distribution, such as the sample shown in Selection 18, and such as the more extended statements of market analysis and commodity analysis given in Selections 19 and 20.

Furthermore, certain helps in actual control of operations have become fairly well standardized. We shall notice particularly certain measuring aids of market administration. Some specimens of a rather voluminous literature in this field are given in Selections 21 to 26, inclusive. They give hints of the uses which can be made of accounting, statistics, and other measuring devices as instruments of control.

Of course, sales management is not all technique and routine administration. Policies must be formed; an organization must be worked out. As samples (they are only samples) of the activities in these two fields we shall look at certain price policies in Selections 27–33; and at certain questions of appropriate organization of the sales department in Selection 34.

PROBLEMS

1. Consult the chart on page 6 and Selection 17 (p. 313). Draw up your own list of the chief phases of the problem of the sales manager.
2. Compare the medieval market with the modern one in respect to the necessity for analyzing the market.
3. "Let us remember that most dealers are still largely without recognized standards of merchandising competition." Why? Put definite meaning into "standards of merchandising competition."

4. What are staples, specialties, branded staples, utility goods, style goods, shopping lines, convenience goods? What value attaches to such classifications? Some writers further ask whether goods must be sold by bulk, sample, or description, whether buyer seeks the seller, or conversely; whether he may expect repeated sales to a consumer, or not. What value attaches to such considerations?
5. Indicate what use a sales manager could make of data showing the per capita wealth of a district, the per capita incomes, per capita consumption, ownership of homes, mortgage indebtedness, standards of living, direction of expenditures (Engel's Law), climatic conditions, geography of the district, predominant industrial activity, nationality of residents.
6. Look through Selection 18 with the aim of answering these questions (*a*) Wherein is there evidence that the tasks of the sales manager are interrelated with those of other functionaries? Let your evidence be specific. Cite the other functionary in every case; (*b*) Cite cases where a psychologist might conduct experiments which would throw light on the problem of the hypothetical sales manager we are dealing with in this section of our work; (*c*) Cite cases where an economist might help; (*d*) Cite cases where a "distribution census" carried out by the government might contribute data.
7. Give the reasons for listing the following factors as an essential preliminary to a study of national distribution: (*a*) The territorial variations in consumption; (*b*) The classes of dealers now handling a similar article; (*c*) The classes of trade sold by these dealers; (*d*) The sales and advertising policies and plans of competitors; (*e*) The volume of business secured at the present time by various competitors, with regard especially to the kind, quality, finish, and price of the product each is marketing; (*f*) The percentage of repeat sales competitors seem to be able to secure.
8. Shaw cites four significant matters relating to control of salesmen: (1) hiring; (2) training; (3) paying; (4) directing. Give at least one modern method connected with each.
9. Compare in regard to the following points the training of salesmen and shop-workers: (*a*) The importance of training; (*b*) The ability to standardize instruction for each group; (*c*) The methods employed.
10. In rating salesmen, what importance should be assigned to the volume of sales, profits from sales, expenses incurred by salesmen, and mail orders obtained along the salesmen's route? What is the object of house organs and sales conventions? What is a sales quota?
11. Distinguish between general and direct advertising.
12. What are the essential prerequisites to a widespread use of sale by description?

13. "Advertising can be spread broadcast as a drag-net, while salesmanship must be reserved for specially remunerative territory." Why or why not?
14. "Some of the greatest failures of advertising goods have been due to the mistaken notion that one can make advertising pay from the start by tacking the cost of the advertising on to the prices." Explain.
15. "The current tendency in marketing goods through advertising is to emphasize not price but the differentiation from staple types and the closer adaptation to the user's needs." Comment.
16. Explain how the keying of advertisements is an instrument of control in the hands of the business manager.
17. Why should the business manager act as carefully when he selects the kind of materials to be used in demand creation as when he determines the various elements entering into the manufacture of his product? Can he be as careful?
18. How would you go about establishing standards for materials of demand creation comparable with laboratory standards common in production? Why try at all?
19. Can laboratory methods be applied to the selection of advertising mediums and material? Illustrate.
20. What is sales planning? What objects does it serve? What would you include in a sales plan?
21. Can you say why the writer in connection with analyzing his product asks "what per cent of increase in the total demand will the capital accommodate"?
22. Under what circumstances is it wise to have your own selling organization? When is it unwise?
23. "No manufacturer, however efficient and honorable the middlemen handling his product are, can afford to be without first-hand knowledge of his market." Why not? What does such first-hand knowledge of the market include?
24. What considerations determine whether a man shall (1) sell at the market minus; (2) sell at the market par; and (3) sell at the market plus?
25. Why should a manufacturer in disposing of unbranded commodities under the orthodox system of distribution turn his energies toward reducing costs of production and the price rather than to particular likes of the consumer?
26. Why is it that many business houses adopt the plan of putting out products in two grades, but retaining to as great an extent as possible the same essential utility or style?
27. What difference, if any, is there between selling under the market and holding a clearing sale?

28. "The bulk of non-trade-marked specialties and of goods which carry dealer's brands are distributed below the normal market price." Why these particularly? How is the middleman remunerated?
29. What is meant by the expression "one-price-policy"? What are its advantages?
30. "The price-maintenance policy originated with the present system of distributing goods through wholesalers and retailers. Large scale, specialized production, dependent upon wide distribution through the regular channels of trade, and cut-throat competition are the conditions out of which grew the demand for this policy." Explain.
31. A person in monopoly control of his market will tend to set his price so as to make the largest net profit. This is sometimes called the law of monopoly price. Suppose a firm has just acquired monopoly control and is now to establish its price policy. Can you tell whether it is likely to sell at the market, or at the market plus, or at the market minus?
32. Under what circumstances would a price policy designed to keep "under the umbrella" of a trust be expedient?
33. At one time there was a rumor that the Ford Motor Car Co. would sell its products for $333 by discontinuing the Ford Agencies and selling by mail. What elements of distribution would make it possible? What elements would work against it?
34. The Curtis Publishing Co. reports a man who was doing a satisfactory business with two competitors in the field. After he had bought out these firms his business became less successful. How can you account for such a situation?
35. An engraving company, with a local market, found on investigation that it was doing about 80 per cent of the business of the market with three competitors to handle the remaining 20 per cent. How could the company increase its business? Make specific suggestions.
36. "The same concern may use different channels of distribution in different markets." How can this be?
37. Why is it that the business man only infrequently realizes how intricate is the problem of determining the agency or the combination of agencies which is exactly adapted to reach the various geographic, or social and economic state of his market?
38. Why should a business maintain a bureau for commercial research? What tasks should such a bureau undertake? What agencies are available today for the performance of such work?
39. What arguments are there for having the advertising manager subordinate to the sales manager? For having him independent of the sales manager?
40. Draw up an argument in favor of the position that the sales manager should have a general knowledge of the other functions of the business, such as finance, technology, personnel control, etc.

41. Some people believe that the sales manager should formulate his policies in a committee made up of himself, the works manager, the personnel manager, and some financial functionary. What arguments do you see in favor of this position? Against it?
42. Should credits and collections be administered under the sales manager?

17. A BRIEF STATEMENT OF THE MARKETING PROBLEMS OF THE MANUFACTURER[1]

What is the proper relation of the sales department to the other departments of a business? What is the relation of the sales department to the production department? How are the sales policies and the credit policies of a business to be harmonized?

What are the selling points of a product? This is a marketing subject worthy of especial attention, for it involves that recognition of the point of view of the buyer which is so essential in all effective saleswork.

The determination of brand and trade-mark policies is another subject of general significance. Shall the manufacturer sell his product branded or unbranded? If it is to be sold as a branded product, shall he sell it under his own brand or under the brands of wholesalers or retailers? There is a series of interesting questions to be taken up in this connection. The selection of a trademark ties in directly with these questions.

How is the market for the product to be analyzed? A manufacturer cannot safely assume that his product will appeal alike to all classes of consumers. Differences in living conditions, in occupations, in habits and customs, and many other factors, as well as general business conditions, determine the class or classes of consumers from whom he may expect the demand for his product to arise. He needs to know where the potential consumers are located and what volume of sales may be counted upon. The more definitely he can determine the potential market, the more readily can he solve many of his other marketing problems.

The management of the sales force brings up another series of problems. How is the sales force to be selected and trained? What method of paying the sales force is to be adopted? How are the activities of the salesmen to be followed and checked? A study of the practice of typical manufacturers in dealing with such problems

[1] Adapted by permission from M. T. Copeland, "Scope and Content of a Course in Marketing," in *Journal of Political Economy*, XXVIII (1920), 396–97.

is obviously essential (see chapter iii, "The Administration of Personnel").

In the marketing plans of a manufacturer, advertising ordinarily should have a definite place. There are some services in the marketing of a product which commonly can be performed more effectively by advertising than by the sales force. The advertising campaign therefore should be planned properly with reference to the specific work it is desired that it should perform in relation to the other sales work of the company. Suppose that a company is organized to manufacture a new food product. The company is starting out on a small scale with the expectation that eventually it will distribute its product to all parts of the United States. The product is to be sold through the orthodox wholesale and retail channels. What advertising should be used to reach wholesalers, retailers, and consumers? Should the advertising precede or follow the initial work of the sales force? How long should it be continued? What mediums should be used? What message is it desired that the advertising should convey? In what sequence are the selling points to be presented? Such questions as these must be taken into account in planning an advertising campaign from the standpoint of the business as a whole.

Other sales policies, such as the use of the guaranty, methods of handling cancellations, and returned goods, must be considered.

Finally, questions of price policy are to be taken up. The factors that must be considered in determining discounts, in fixing the prices to be charged to various classes of customers, and in supervision of the execution of these price plans are often perplexing to the executive who must solve them.

18. ANALYSIS OF PRODUCT, MARKET, AND CHANNELS OF DISTRIBUTION[1]

[This is presented as a sort of check list of the analysis which can be made of marketing problems. The student should work through it slowly, keeping constantly in mind these questions: (1) Does the sales manager need to know about this item? (2) How can he find out about it? (3) Precisely what is meant by saying that marketing problems are inter-dependent with all other business problems?]

[1] Adapted by permission from Mac Martin Advertising Agency, Inc., Minneapolis, *Advertising Campaigns*, pp. 1–3. (The Alexander Hamilton Institute, 1921.)

PART I. ANALYSIS OF THE PRODUCT TO BE ADVERTISED

A. Demand
1. Developed, undeveloped, or overdeveloped
2. Necessity or luxury
3. Staple or novelty.
4. Article may be a "repeater"
Profit in most business is in the re-orders
Must gain the confidence of customer
Investigate the article to find per cent of repeat
5. A "year-round seller" or seasonable
6. Present total annual consumption of the article

B. Supply
1. Present total capacity of plant
2. Raw material
3. Labor
4. Management
5. Capital
a) What per cent of increase in the present demand will the capital accommodate
b) How much of an investment in "good-will" will the present capital accommodate
c) How much can be spent before results are secured
How much could be spent if necessary

C. Quality
1. Can it be improved upon in
a) Materials or workmanship
b) Through sight, touch, taste, hearing, or smell
c) Substance, size, or shape
2. The name
a) One or more names
b) Can the name be protected as a trade-mark
c) Certain names are held by the courts to be unpracticable
d) The name should be distinctive
e) It should relate to the product, its uses, or associations in sound or in meaning:
"Sunshine" for biscuits
"Gold Dust" of a golden-colored washing powder
"Ivory" for soap of that color
f) It should be easy to pronounce
g) It should be short
B.V.D. vs. Hart, Schaffner and Marx

3. The container, cover or package
   a) Should be distinctive
   b) Convenient for all of the purposes to which it may be put
   c) Related to the name or to the article, to its uses or claims in color, shape or in style of type

D. Prices
   1. Quantity discounts to dealers
   2. Discounts to consumers
   3. Price competition with (a) Jobbers (b) Retailers (c) Consumers

Profits
   1. Comparison of profits with (a) Manufacturer (b) Jobber (c) Retailer

PART II. ANALYSIS OF THE MARKET

A. Geographical
   1. Is the field (a) International (b) National (c) Territorial (d) Local
   2. Is the field (a) City (b) Town (c) Rural district

B. Climatic
   1. Warm vs. cold (ice skates, furs, sleds, etc.)
   2. Sunshine vs. rain (rubbers, umbrellas)
   3. Length of selling season (straw hats, awnings)

C. Seasonal
   1. Study the time and under what circumstances an individual comes into your market

D. Social
   1. Analyze customers
   2. Elements to take into consideration
      a) Who makes the purchase
      b) Who influences the purchase
      c) Purchase made more often by (1) Men (2) Women (3) Children
      d) Purchase made by (1) Rich (2) Middle class (3) Poor
      e) Purchase made by (1) Single people (2) Married people
      f) Purchase made by (1) Young (2) Middle aged (3) Old people

E. Financial
   1. Conditions "good" or "bad"
   2. Transportation charges

F. Competition
   1. Number of competitors
   2. Number of years each has been in the business
   3. Present total business of each
   4. Increase or decrease each has experienced during a period of years up to the present time
   5. Territory covered by each
   6. Policies of each in regard to (*a*) Sales (*b*) Advertising (*c*) Credits

G. Distribution
   1. Number of purchasers among (*a*) Jobbers (*b*) Dealers (*c*) Ultimate consumers
   2. Number of possible purchasers among (*a*) Jobbers (*b*) Dealers (*c*) Ultimate consumers
   3. Methods of distribution
      a) Customer calls for advertised brand
      b) Dealer suggests brand, purchaser usually takes one he has seen or heard of
      c) Force the dealer

PART III. ANALYSIS OF THE CHANNELS OF DISTRIBUTION

A. The agencies of distribution
   1. The manufacturer or producer
   2. The importer, broker, or sales agent
   3. The wholesaler or jobber
   4. The dealer or retailer. He also may be a part of the manufacturers' organization
   5. The consumer

B. The channels of distribution
   1. From producer to consumer
      a) By mail
      b) By salesmen or canvassers
   2. From producer to retailer to consumer
      a) Through unrestricted sale to retailers
      b) Through sale to exchange retail stores
      c) Through retail stores owned by the manufacturer (Rexall stores)
      d) Through sale to mail-order houses and other consignment agencies

3. From producer to wholesaler to retailer to consumer
   a) Through any wholesaler and any retailer (most used channel)
   b) Through producer's own territorial agents to any retailer
   c) Through producer's own territorial agents to exclusive retailers
4. From producer to selling agent, importer, broker, or commission agent, to wholesaler, to retailer, to consumer

C. Conditions relating to the product
1. Salable by description, sample, or bulk
2. Is there an element of "shopping" in the product
3. Does selling require especially educated salesmen
4. Will the product require special attention after it is sold in order to keep the customer satisfied
5. Can a retailer profitably carry a full line of more than one competing brand or such a product

D. Conditions relating to the market
1. Establish satisfactory available depots
2. Is the possible demand in the territory sufficient to support profitably a separate selling organization
3. Are distributors in the territory accustomed to extend long and short terms of credit
4. The functions of middlemen: (*a*) Sharing risk (*b*) Transporting goods (*c*) Selling (*d*) Financing (*e*) Assembling, assorting, and reshipping
5. Is the period of time between one demand and the next from the same consumer shorter or longer than the period of time required for the most rapid transportation between producer and consumer
6. Is the territory near enough to producer so that transportation charges on the smallest unit demanded will not materially affect the price in competition

E. Conditions relating to classes of distributors
1. Class of dealers through whom it is most profitable to distribute
   a) The one most closely in contact with consumers purchasing competing or associated classes of goods
   b) The one which can distribute most rapidly

See also p. 354. An Organization of the Sales Department.

19. SOME PHASES OF MARKET ANALYSIS[1]

[It will be helpful for the student to think of this selection as a more extended statement of Part II of the preceding selection. It would be a useful exercise to work out a similarly extended statement for Parts I and III.]

In order to determine to what particular class of customers his sales campaign should be directed, a manufacturer finds it necessary to study his market carefully under present conditions of keen competition. Blunderbuss methods are wasteful; hence they are becoming antiquated. The demand for any article varies according to purchasing power, living conditions, occupations, racial characteristics, climatic conditions, and numerous other influences affecting the different classes of consumers. The object of market analysis is to determine which class or classes of consumers constitute the potential market for the product, to ascertain where that class is located, and to find out what channels of distribution are most readily available for reaching them.

There are few, if any, commodities for which equal per capita sales may be expected in all sections of the market, provided the market is more than local in its scope. In each district there are numerous classes of consumers with widely different tastes and desires, and the relative proportions of these classes in different districts always vary. In New York City, for example, the population of the metropolitan district in 1910 was 6,475,000. In the same year the population of the Cleveland metropolitan district was 613,000. From these figures it cannot be assumed that the New York market for any particular article is potentially ten times as great as that of Cleveland. New York represents the extremes of wealth and poverty. Fifth Avenue and the Lower East Side are at opposite ends of the economic scale. Their wants and their purchasing power are wholly unlike and each differs from the large middle-class strata. In Cleveland the relative proportions of these several classes, with their numerous gradations of purchasing power and of wants, are not the same as in New York. The population of Cleveland, furthermore, differs in its composite parts from that of Cincinnati or other cities, and these differences in the make-up of the population affect potential demand. Another line of demarcation is between urban and rural districts.

[1] Adapted by permission from M. T. Copeland, *Business Statistics*, pp. 178–83. (Harvard University Press, 1917.)

Because of these diversities a reliable estimate of potential demand can seldom be made upon a gross per capita basis.

In analyzing the market for some products, conditions other than those of a strictly personal nature must be taken into account. A manufacturer of electric flat-irons, for example, in analyzing his market found that in one city of 300,000 population 25,000 families were supplied with central station electric current. Thus there were 25,000 possible customers in that city. In another city of approximately the same size only 3,000 families were supplied with electric current; hence the potential market in this second city was much smaller.

For some products the market is clearly defined; in such cases the market is easily analyzed by the manufacturer. The manufacturer of machine tools, for example, knows that his product can be sold only to machine shops and engineering works and his task is to learn all the establishments existing and planned for in the territory that he wishes to cover with his sales organization. A similar situation confronts other producers of equipment and materials that are sold to manufacturers. Certain manufacturers of specialties sold to other classes of customers can encompass their market in a list that does not assume excessive proportions; a manufacturer of surgical appliances, for example, can readily obtain and utilize a practically complete list of possible customers. For the great mass of goods sold at retail, however, and for general supplies sold to manufacturers, the market is of a different type and potential demand is much less easily estimated.

In undertaking an analysis of the market for an article which is sold over a wide territory and for which a market index can be selected only with difficulty, too much attention may be given to wealth statistics, which are assumed to indicate incomes received by consumers. Wealth statistics, as a rule, have little significance in market analysis. In the first place, there are no reliable wealth statistics, and, in the second place, even if such statistics were available, they would give slight clue to the probable demand for any particular article. Wealth statistics are published, to be sure, by the United States government, but they are rough approximations.

Wealth statistics are commonly reduced to a per capita basis, but a per capita wealth figure is of little worth for any purpose, for it does not show the distribution of the wealth. It makes a vast

difference to manufacturers looking for prospective markets whether the wealth in any district is fairly evenly distributed among the consumers or concentrated largely in the hands of a few very rich persons; the quantity of any commodity purchased by an individual consumer seldom varies in direct proportion to his wealth or income.

Finally, even if the wealth figures were available in such form that they could be relied upon and the distribution of the wealth among the population ascertained, the figures would not accurately indicate market potentialities. Not only are wealth statistics inadequate indices of incomes, but different classes of people engaged in different occupations and living under different conditions do not expend their incomes in the same way, even if those incomes are approximately equal.

Average wages are another set of statistics occasionally referred to as furnishing an index of potential demand. The United States Bureau of the Census publishes average wage statistics, and similar figures may be obtained from other sources. An average wage, however, for all the persons engaged in manufacturing in Massachusetts, for example, includes the wages of numerous highly skilled workmen and also the wages of unskilled men, women, and children. The average is not representative and does not indicate that Massachusetts is necessarily a poorer potential market for any manufacturer than some other states where the average wages may be higher.

Per capita consumption figures for large groups of commodities, such as clothing or foodstuffs, are finding their way into some advertising publications, as affording a guide to potential markets. The only per capita consumption figures which are worthy of consideration are those for such articles as coffee or sugar, where fairly accurate records of importation and domestic production are maintained. The census figures for the value of the product of the various manufacturing industries are too inaccurate, in the form in which they are presented, to be acceptable as a basis for estimates of per capita consumption, and there is so great uncertainty as to the amounts added to the manufacturers' selling prices in the course of the marketing processes to warrant placing any reliance upon estimates of total retail selling value or total amounts paid by consumers for these products. These per capita consumption figures, moreover, are gross figures including many grades and qualities, some of which are virtually non-competing. Such statistics are of little aid in making a careful market analysis.

Instead of attempting to use statistics for wealth, income, or per capita consumption, the first task in undertaking a statistical analysis of a market is properly to determine just what class or classes of consumers constitute the potential market and, if there are varying degrees of demand, what demand may be expected from each class. For this, personal investigation or inquiry may be necessary. The next step is to ascertain the number of consumers of each class in each sales district. From these two sets of statistics the total potential demand for each district under normal conditions can be estimated.

These figures for estimated potential demand, when compared with past sales records, show in which districts the best opportunities exist for sales development and serve as a basis for establishing quotas for salesmen. Ordinarily the comparison of sales records with estimated potential demand shows that the degree of saturation is not uniform in all markets. It is usually found upon investigation that a higher percentage of potential demand has been realized in some markets than in others, thus indicating the direction in which expansion may most readily take place.

Another factor to which attention may be given in analyzing a market for some products is the percentage of distribution—that is, the percentage of the total number of possible retail outlets in which the goods in question are sold. A manufacturer of a food product sold in retail grocery stores generally wishes to induce as large a number of grocers as possible in each district to carry his product. If 75 per cent of the retail grocery stores are selling the article, he considers that he has 75 per cent distribution, without reference, of course, to the relative volume of trade of the retailers.

In establishing sales quotas, allowances must be made not only for differences in degree of saturation and percentages of distribution but also for differences in general business conditions. From season to season general business conditions fluctuate in each district. A poor cotton crop may cut down the normal demand in the cotton states while a good grain crop in the same year may cause business to be exceptionally brisk in the wheat district. Hence the statistical indices of business conditions in each district must be taken into account in comparing salesmen's records with established quotas.

See also p. 66. The Location of Retail Establishments.
p. 74. An Outline of the Relations of Transportation to Site Location.

20. SOME PHASES OF COMMODITY ANALYSIS[1]

In general, industries may be divided into two classes: those making utilities and those making style goods. Utilities comprise those articles which are bought by the consumer solely on the basis of quality or efficiency for the price and without thought of their pleasing his taste or fancy: e.g., agricultural implements are utilities.

Style lines are those in which the consumer's preference is determined by qualities other than utility—all those lines which appeal to individual tastes and fancies. In general they are the lines that involve the element of adornment and display, such as clothing of all kinds, jewelry, dress accessories, household furnishings and decoration.

Many lines are at the same time utilities and style goods. For example, clothing and furniture in certain grades are bought primarily for serviceable qualities, but in other grades must meet the most exacting requirements of style. In automobiles, the truck is a utility; i.e., is judged on its ability to produce wealth. The pleasure car, on the contrary, is both a utility and a style carriage.

In utility lines, theoretically, a single concern, if it excelled, would secure an entire monopoly; for if a manufacturer so perfected his manufacturing process that he was universally acknowledged to have the most efficient article at the price, theoretically everyone would buy his product. Practically, if one manufacturer can attain a very high degree of efficiency in manufacture, another can develop near enough to his standard to be a competitor; and practically, there is a value in a name, and there is a difference in public opinion. Hence it seldom happens that in any line where there is no protection by control of raw material or patents, anyone does attain an absolute monopoly. However, in these lines there tends to be concentration down to a very small number of manufacturers, unless freight conditions affecting raw materials or finished product necessitate a sectional distribution of plants.

In the manufacture of utilities, as concentration progresses, it becomes increasingly difficult for a new firm to gain a foothold; for ordinarily the new manufacturer has to pass through an unprofitable period before he attains efficiency enough in manufacture to hold his own in competition with monopoly. In these lines where the economic tendency is toward concentration, there is no place for the small manufacturer unless he can adapt his product to meet some peculiar local need, and no place at all for the middle-sized producer.

[1] Adapted by permission from C. C. Parlin, "Why and How a Manufacturer Should Make Trade Investigations," *Printers' Ink* (October 22, 1914), 12, 74–76.

The manufacturer is likely to face the alternative of growing great or being crowded to the wall.

In style lines, on the other hand, people buy not only quality and efficiency but also an intangible something which by its display represents the owner's individuality. Since there are many types of individualities there must be a considerable number of manufacturers to supply the individual wishes. In the manufacture of a style line, whenever a manufacturer gets a majority of the market a style reaction sets in against him. Thus it comes about that no one can gain and permanently hold any large per cent of the total market. Hence there are bound to be a considerable number of producers, and their relative rank is likely to vary from season to season as a fickle public smiles first on one, then on another. In these lines the opportunity for the small and medium-sized manufacturer continues.

If the manufacturer produces an article sold to the consumer, it is important to know to what extent it is bought by men and to what extent bought by women, for men and women purchase through different motives.

A man ordinarily buys either at (1) the most convenient place, (2) by impulse, (3) in an accustomed place, or (4) by brand. He does not compare values and there is little tendency for his trade to be concentrated in shopping centers or in large stores. In general, men's trade is held back in the suburban places and remains scattered in a multitude of small establishments.

Women's trade, on the contrary, is of two distinct kinds: (1) convenience goods and (2) shopping lines.

Convenience goods comprise notions, cheap cottons, and, in general, the lower end of women's purchases.

Shopping lines, in general, comprise the upper end of women's purchases, such as cloaks and suits, draperies, carpets, millinery. In the purchase of convenience goods the woman ordinarily buys on the same motives as the man: that is, at the most convenient place, or on impulse, or sends the children to an accustomed store, or orders by brand. These lines, like the men's, find their sale in a multitude of suburban shops or crossroad stores and the manufacturer who would sell these lines must have the assistance of the jobber.

In the purchase of shopping lines, on the other hand, the woman does definitely want to compare values (apparently in three stores) and the department store, which is organized to furnish facilities for

women's shopping, tends to get the great bulk of this trade. Hence the trade in shopping lines is sharply concentrated in a comparatively small number of shopping centers and in a few stores within those centers.

It is of prime importance to a manufacturer to determine in which classification his goods fall and to what extent either shopping or convenience buying is the prevailing motive. Upon this depends his method of sale. If he has a men's line or a convenience line, his distribution is widely scattered and the multitude of small merchants handling his wares prefer to buy of the jobber. Such a manufacturer therefore should not push his direct sales methods farther than is consistent with a jobbing policy. In some lines he will find it advantageous to supplement his jobber program by selling direct to those large stores to which he may sell without jeopardizing his jobber connections. If, on the contrary, he has a shopping line of any considerable volume, the direct sales method will be found best adapted to his needs; for the sale opportunities are confined to large stores, and, in general, large merchants prefer to buy direct. A clear understanding of such conditions is often necessary to determine the foundation principles of a selling system.

21. MEASURING AIDS IN SALESMEN CONTROL

A[1]

One of the first things that the new sales manager did was to study the individual territory of each salesman—estimate what it should produce in sales for his house, and compare this result with what was being produced.

In order to do this intelligently he procured a map cabinet and a set of state maps. Now most concerns whose policy it is to designate a route for their salesmen use a map system for that purpose but many concerns depend largely on the initiative of their salesmen in this and many other respects, and judge their efficiency on aggregate results.

But this sales manager found other uses for a map record—first he carefully drew the boundary lines of each salesman's territory on the maps wherever more than one salesman worked in the same state. Then he prepared a list of every town of five hundred population and over in each territory. That was the range of towns in which the goods could be sold profitably.

[1] Taken by permission from "Close-formation Tactics in Sales Development," *Printers' Ink* (April 1, 1915), 3–6.

These lists were then compared with the sales records, and each town checked to indicate whether the house sold any goods there. When the lists were completed they told an amazing and very interesting story. The average salesman was selling goods in only about half the towns in his territory. At one stroke the new sales manager had uncovered a vast field for sales development.

He analyzed it more closely. First he transferred the information given in the lists to the territorial maps by using a greenheaded tack to designate every town where the company sold goods. Redheaded tacks were used to indicate the no-sale or opportunity towns. The maps then presented a comprehensive picture of each salesman's territory. The weak spots stood out in the limelight—a surprising number of them.

Why? How can they be eliminated? These were the next questions.

The lists were revised to show a more complete story, which included the population of each town, the names of all well-rated dealers in each town, and the exact amount of sales to each customer during the preceding year. These facts, when assembled, disclosed other valuable information. They brought to light special weaknesses of various kinds in individual salesmen. One salesman's record, for example, showed no sales whatever in towns of less than 5,000 population. Evidently he passed up smaller towns entirely. Another salesman seemed to take the opposite course. His small towns were nearly all well developed, but he secured very little business in the large cities. It was noticeable that some men almost invariably secured their orders from concerns whose commercial ratings indicated them to be the smaller stores in a town. In fact the lists and the maps together provided an excellent bird's-eye view of what each salesman was doing in his territory.

A copy of the list pertaining to his territory was sent to each salesman, together with a letter directing his attention to obvious conclusions. The letter was not in the form of a reprimand, nor did it contain any definite instructions that would be construed as a positive order. It pointed out the opportunities of the salesman to increase his sales by more thorough application along certain definite lines. Furthermore, each salesman was told that the house was going to conduct a special direct mail campaign to interest every well-rated dealer in every town where he was not selling goods.

The inference of course was that he was expected to call on those dealers. This had a distinct moral effect on most of the men, as they realized for the first time that their work was being closely watched in the house. Many of them took the cue and succeeded in opening some nice new accounts. Also, the mail campaign stimulated a good many inquiries which forced them to call on dealers they had never solicited before.

As a matter of fact, however, it developed that most of the salesmen had too much territory—more than they could work thoroughly. Naturally they had hit only the high spots at first, and gradually settled down to devoting most of their time to regular customers. The sales manager arrived at this conclusion as the first season drew to an end, because the red-headed tacks were still very much in evidence on the maps.

Here was a problem that required some thought. It meant putting on more men. The only way to make room for new men was to take territory from old ones—and the average salesman is jealous. A closer study of the maps and the red tacks helped to solve this problem.

One example will illustrate what was discovered and what occurred in most cases: The territory of one salesman consisted of the whole state of Georgia. He lived in Atlanta and made that city his headquarters. If you should draw a horizontal line through the center of the state you would find that Atlanta is located nearly in the center of the upper half. The tacks on the map of Georgia showed that this salesman got most of his business in the upper half of the state. In other words, he spent most of his time near home, and even in that section there were more red tacks than there were green ones in the lower part of the state.

It so happened in this case that another salesman, who was a prodigious worker, had found the state of Florida too small to occupy all of his time. Consequently a slice of southern Georgia was taken from the Georgia man and given to the Florida man. The Georgia man kicked like a steer, at first, but gave up when he was shown that the business he really lost by the transaction was hardly enough to justify the time and expense of getting it. He was also shown a lot of red-headed tacks in the remaining part of his territory.

During the next season both men increased their sales—the original Georgia man about $10,000 with less territory, and the Florida man got about $20,000 out of his new Georgia territory.

B[1]

A star salesman for a wholesale crockery house came into the sales manager's office. "Mr. Stewart," he said, "I must have more money next year. My sales have been $20,000 more this year than last, and my expenses have increased only one-half of one per cent." He got the raise.

Then came another. "Mr. Stewart," this salesman ventured, "I think I ought to have more money next year. Of course, I know that I haven't sold much more this season than last, but I have been with you fifteen years. I went out to that territory when you didn't have an account in the state. I have built up such a good will for the house that I believe the mail-order sales from my territory will exceed those from the territory of anyone else on the force."

But Stewart did not *know* this, or if he did, he probably believed that the house was as largely responsible for the good will as the salesman. Stewart had a rather firmly rooted idea that a salesman's value to the house is determined by a single problem in division—total selling expenses divided into total sales gives percentage of selling cost. By this process Stewart found that this salesman's percentage was a trifle higher, and his total sales considerably lower than those of the star. Result—this salesman did not get his raise.

Now Burke, a competitor of Stewart located two blocks away, had the same requests under similar conditions from two of his salesmen. But in this case, the star was refused the raise, while the apparently poorer salesman secured a substantial increase. And in spite of this seeming reward of mediocrity at the expense of ability, Burke is the keener sales manager. The card index in his desk showed that although the star salesman had sold more goods than any other man in the house, and his expenses were as low as the rest, his *net* profit to the house was considerably below the standard. He had concentrated his efforts on the staples which ran into big figures but yielded small profits. The other salesman had devoted his time to the more profitable specialties, which held down his gross sales, but increased his net value to the house. Burke's cards showed this fact and this salesman got the raise.

Two factors determine the salesman's value: his net profit to the house, as shown by actual figures; and his trade-building ability as reflected by mail orders, a continued patronage and good will.

See also p. 192. Measuring Aids of Personnel Administration.

[1] Taken by permission from D. L. Kinney, "Determining the Value of Salesmen," *System*, XVII (1910), 402.

22. MEASURING AIDS IN ADVERTISING CONTROL[1]

The shrewd advertiser of today before beginning a campaign makes three important tests. The public passes judgment: (1) on his copy, (2) on the mediums in which the copy is placed, and (3) on the field in which the medium circulates.

After copy has been approved as a puller by the head of the firm, it ought to be put on trial. It should be keyed and the results carefully checked. Other copy should be placed in rival publications or handled in the same routine of distribution and each month the advertisements should be interchanged among the mediums selected.

A method generally used by big advertisers is to try copy for a general campaign in a daily newspaper in a large city, a daily newspaper in a small city, a trade or class publication, a national monthly of limited circulation, and a woman's magazine. The copy is crossed from publication to publication, and if there is any doubt about the fairness of the test the copy is inserted several times in the same magazine. By keeping count of replies and sales, it is easy to find which advertisement consistently brings the best orders.

Some firms have kept records of this sort for years. Before they start a campaign they know accurately what pieces of copy "take" and what mediums bring the best returns on their offer. The advertising manager also has before him at the beginning of each test theoretical figures which indicate the number of returns he should receive from mediums or circularizing schemes with which he has had experience. If his best copy in his best mediums falls below this standard, he knows that he is in error and that he must locate copy trouble before the campaign may be launched.

Testing frequently shows the advertiser the amount of space to use to get the best percentage of returns. In Cincinnati a test showed a manufacturer that single-column space secured as good results as a page advertisement in the same medium.

Having built publicly approved copy, the general or local advertiser must still determine what classes of mediums and what individual periodicals or other distribution he will adopt, whether trade magazines, literary magazines, weeklies, monthlies, or any one of the many other mediums which offer to sell his product.

The experienced general advertiser has a list of publications with low rates but limited circulation which pull in constant ratios to the national medium. Advertisements are placed in these mediums

[1] Adapted from W. S. Zimmerman, "Proving the Pull of Advertising," *System*, XXI (1912), 156–61.

during the copy test and as results of such tests advertising contracts are let with a keen forecast of the results.

Care must be taken to insure, as nearly as possible, identical conditions for test and campaign. In national campaigns business conditions in the nation must be considered. A backward, cold summer or a warm winter must be considered in reckoning results. The length of time an advertisement runs, the space and position which it occupies in the medium used, the strength of competitors in the same field, must all be considered. When campaigns are conducted in newspapers, local conditions must be investigated. The hour and the day of the week when the advertisement appears have distinct effects on results. Local season, celebrations, and disasters make differences.

The chief asset of the effective advertiser is his record of past results. The man who believes that he can keep such results in his head or who guesses in selecting mediums for his campaigns is deliberately draining profits into losses. One Chicago man, finding that the ordinary scrapbooks were not large enough for his purpose, secured the largest-sized loose-leaf invoice books. The advertisements are placed on manila sheets and kept until out of date. Then they are removed from the covers, tied up, and stored in a confidential file in the vault. With each advertisement is a printed slip showing the amount of sales and inquiries traced to the copy, the mediums in which it appeared, and the number of times it ran. Another sheet shows in detail the cost of the advertisement proportioned among the various departments. Advertising cost is accounted as sales cost.

Another advertiser keeps careful watch of competitors' copy and the store shoppers keep him informed of results of the competitors' sales. The rival copy is filed in an invoice book kept for the purpose and notes are attached carrying the information secured. In this way he checks up selling methods of worth and, when occasion arises, improves upon them. The same book contains specimens of magazine advertising and copy in other lines of business which is written with a suggestive or distinctly original appeal.

The success of one of the largest advertising agencies in the United States is admittedly based on the vast amount of evidence accumulated as to copy, seasons, prospects, fields, and publications.

23. MEASURING AIDS APPLIED TO THE SOCIAL ENVIRONMENT[1]

How conditions may be analyzed and the facts thus sifted be utilized is illustrated by the recent experience of one great industry. By reason of its size and unquestioned leadership, perhaps, it had developed a blind side in its outlook on the selling field.

Finally, the president brought matters to a focus.

"It's time," he said, "to stop traveling around in circles."

The work began next day. First a conference of all the manufacturing executives was called. In company with the president, they sized up the production situation from every angle. They examined the goods from the point of view of salability, value, efficiency, safety in use. But a searching analysis of trade reports, salesmen's complaints, the results of technical investigation, and comparative tests established nothing except that the goods were sound.

Interest centered next on the sales organization and the fundamental selling situation. A study of the whole industry was first made. Graphic charts presented the volume of business of the six leading companies. They pointed back forty years. Getting the sales figures of two of these companies was easy; the other three guarded their statistics jealously, but sufficient data were secured to make the final estimate one very close to the actual figures. This sales chart showed conclusively that there had been no decrease in output which other firms had not felt more keenly; while the ratio of increase was always greater for the company than for the other concerns. In a word, not one firm, but the whole industry, was suffering the same sickness, whatever that might be.

In a nutshell, the peculiar situation in the trade hinged on three separate developments: The first and by far the most important was the movement of population to the cities and the decrease of wild and uncultivated land. When a man moved in from the country to take a job in a store or factory, his use of the company's products virtually ceased.

The second development was the passing of control of distribution from the hands of the jobbers in the central markets and the multiplication of smaller wholesale houses to which the carrying and pushing of the company's line might be a matter of only casual

[1] Taken by permission from J. G. Fredericks and F. M. Faker, "Finding the Facts that Count," *System*, XXII (1912), 121–24.

interest. If the goods were called for, they would be supplied; but a consumer's demand was the only reason for stocking and handling them which these new houses recognized as imperative.

The third transformation which had taken place in the distribution field was the entry of the department store and the mail-order house into a field which had always been controlled exclusively by dominant specialty dealers in every town of any size throughout the country.

To arrive at these conclusions thirty or forty graphic charts were compiled.

This conclusion indicated as plainly as a "graph" itself what would have to be done to restore sales vigor and efficiency. Constructive educational work was necessary to revive the interest of the urban consumer. His changed situation had to be taken into consideration in framing the new appeal. New uses had to be discovered and pointed out. Many of the products would need adapting to this changed physical situation.

The advertising manager, in touch for the first time with the environment and needs of consumers, was able to plan a campaign which would turn the attention of these forgetful buyers again to the company's products. Knowing where the various classes were grouped, he was able to choose mediums and vary appeals so that each dollar spent earned its right proportion of inquiries and orders. His campaign directed at retail dealers had the same virtue of shooting at a mark made visible by the light of exact knowledge.

The sales manager, in his turn, found the board of directors a unit in backing up the vigorous program he laid out for handling the jobbers and coaxing his dealers into line with the new program of co-operation. Even on the negative side, the investigation was not without result. The works superintendent, who had been urging an addition for two years, after studying the "graphs," acquiesced in the board's decision that for three years every surplus dollar was worth double its factory value if expended in the selling field.

24. MEASURING AIDS MAY RESULT IN EXPENSE STANDARDS[1]

[One of the most useful administrative devices the manager can have is that of expense standards. If he knows what is current practice in various fields of expenditure he has a sort of norm against which to measure his own performances and with which to check his own figures in preparing sales budgets. Generalized statements of current practice by other firms are of course no final guide for the manager. He must always keep in mind his own peculiar circumstances.

The tables of operating expense given below may be called expense standards. They show in percentages of net sales (net sales = 100 per cent) the various elements of expense in the businesses indicated in the captions. Wherein are you, a manufacturer of commodity *x* interested in the following tabulations?]

OPERATING EXPENSES IN RETAIL GROCERY STORES

Item	Lowest Percentage	Highest Percentage	Common Percentage
Wages of salesforce	3.0	8.7	4.7
Advertising	0.01	2.82	0.2
Wrappings and other selling expenses	0.11	2.26	0.55
Total selling expense	3.41	9.94	5.8
Wages of delivery force	0.26	2.84	1.4
Other delivery expense	0.04	2.37	1.0
Total delivery expense	0.66	4.36	2.4
Buying, management, and office salaries	0.58	5.97	1.6
Office supplies, postage, other buying, and management expense	0.01	1.18	0.1
Total buying and management expense	0.78	6.38	1.7
Total interest	0.15	2.28	0.9
Rent	0.33	3.45	1.1
Heat, light, and power	0.07	0.98	0.25
Taxes (except income and buildings)	0.01	0.49	0.13
Insurance (except on buildings)	0.02	0.62	0.14
Repairs of store equipment	0.01	0.43	0.08
Depreciation of store equipment	0.07	2.17	0.25
Total fixed charges and upkeep expense	1.35	6.82	3.0
Miscellaneous expense	0.19	1.97	0.5
Losses from bad debts	0.04	3.31	0.4
Total expense	9.0	22.8	14.0
Gross profit	10.5	26.04	16.9
Net profit (or loss)	6.05 *Loss*	9.29 *Profit*	2.3 *Profit*

[1] Taken from Bulletins 10 and 13, Bureau of Business Research, Harvard Graduate School of Business Administration. (Harvard University Press.)

OPERATING EXPENSES

In General Merchandise Stores

Item	Lowest Percentage	Highest Percentage	Common Percentage
Wages of salesforce	2.1	13.08	5.6
Advertising	0.03	1.79	0.3
Wrappings and other selling expenses	0.12	0.68	0.3
Total selling expense	2.37	14.16	6.4
Wages of delivery force	0.26	1.47	1.0
Other delivery expense	0.14	1.41	0.67
Total delivery expense	0.47	2.22	1.7
Buying, management, and office salaries	1.08	5.4	2.4
Office supplies, postage, and other management expense	0.12	0.7	0.2
Total buying and management expense	1.27	5.4	2.8
Total interest	0.54	4.95	2.2
Rent	0.49	2.9	0.9
Heat, light, and power	0.06	0.74	0.3
Taxes (except income and buildings)	0.09	0.99	0.4
Insurance (except on buildings)	0.07	1.76	0.37
Repairs of store equipment	0.01	0.38	0.09
Depreciation of store equipment	0.05	0.77	0.3
Total fixed charges and upkeep expense	2.11	8.53	5.0
Miscellaneous expense	0.07	0.98	0.3
Losses from bad debts	0.02	2.64	0.4
Total expense	10.03	29.5	15.5
Gross profit	9.8	31.5	19.0
Net profit (or loss)	10.18 *Loss*	17.7 *Profit*	3.4 *Profit*

In Shoe Departments of Department Stores

Gross profit on merchandise	12.6	39.1	28.1
Salaries and wages of buying force	0.39	3.44	1.15
Other buying expense	0.01	1.92	0.25
Total buying expense	0.67	3.67	1.4
Salaries and wages of salesforce	4.92	13.5	8.4
PM's	0.07	2.5	0.65
Advertising	0.49	7.3	1.9
Wrappings and miscellaneous selling expense	0.02	1.5	0.35
Total selling expense	7.2	18.9	11.3
Delivery expense	0.25	2.32	0.6
Management and office salaries	0.8	4.0	2.1
Office supplies and expense	0.03	1.98	0.1
Total management expense	1.0	4.78	2.2
Rent	1.5	10.0	3.4
Heat, light, and power	0.2	2.6	0.7
Insurance on stock and equipment	0.18	1.33	0.55
Taxes	0.17	1.35	0.35
Repairs and renewals of equipment	0.2	2.0	0.4
Depreciation of equipment	0.2	1.17	0.4
Total fixed charges and upkeep expense	3.5	11.7	5.8
Miscellaneous expense	0.05	6.0	2.0
Losses from bad debts	0.01	0.26	0.1
Total expense	19.0	33.4	23.5
Net profit from merchandise operations	16.6 *Loss*	9.82	4.6
Total interest	0.69	11.3	2.2
Stock-turn	0.89	3.1	1.5

OPERATING EXPENSES IN CHAIN SHOE STORES

Item	Lowest Percentage	Highest Percentage	Common Percentage
Gross profit on merchandise	12.5	45.5	28.4
Total buying expense	0.2	2.95	0.95
Salaries and wages of salesforce	2.5	16.5	6.9
PM's	0.03	2.1	0.5
Advertising	0.0	16.3	2.3
Wrappings and miscellaneous selling expense	0.02	1.0	0.15
Total selling expense	4.7	33.0	9.85
Delivery expense	0.0	5.5	0.37
Management and office salaries	0.08	5.0	1.6
Office supplies and expense	0.01	1.2	0.1
Total management expense	0.11	6.0	1.7
Rent	1.33	27.8	8.6
Heat, light, and power	0.12	3.5	0.9
Insurance	0.08	1.88	0.3
Taxes	0.01	2.04	0.15
Repairs and renewals of equipment	0.01	4.4	0.15
Depreciation of equipment	0.1	8.9	1.0
Total fixed charges and upkeep expense	1.55	33.5	11.1
Miscellaneous expense	0.1	8.8	0.6
Total expense	9.85	57.6	24.6
Net profit from merchandise operations	31.9 *Loss*	20.3	3.8
Total interest	0.53	7.4	2.5
Stock-turn	1.1	4.6	1.7

25. MEASURING AIDS REFLECTED IN THE PROFIT AND LOSS STATEMENT[1]

[The student should take this opportunity to examine with some care one of the most important reports which the manager secures from his accounting system. It may be said to represent in figures the life history of the concern for the period it covers. If such a report is taken in connection with the kind of material presented in Selection 25, the manager may secure at least a preliminary notion of the spots at which expenditures may wisely be increased or decreased. If profit and loss statements are drawn at regular intervals, they may again be used as the first check on efficiency of operations in the various parts of the business. We shall have occasion to use the profit and loss statement again in a later chapter when we take up the manager's administration of finance.]

[1] Supplement to Publication of Graduate School of Business Administration, Harvard University, Vol. III, No. 3 (1917). Bulletin No. 2, Bureau of Business Research.

PROFIT AND LOSS STATEMENT FOR SHOE DEALER

for period extending from.....19....to.....19....

				Percentage
Merchandise Statement:				
1. GROSS SALES	.....			
2. RETURNS	.....			
3. ALLOWANCES	.....	.....		
4. NET SALES			.....	100%
5. NET INVENTORY OF MDSE. AT BEGINNING OF PERIOD	.....			
6. PURCHASES OF MERCHANDISE AT BILLED COST	.....			
7. FREIGHT, EXPRESS, AND CARTAGE ON PURCHASES OF MERCHANDISE	.....			
8. Total Merchandise Cost		.....		
9. Inventory of Merchandise at End of Period	.....			
10. Discount on Inventory of Mdse.	.....			
11. Depreciation of Merchandise	.....	.....		
12. NET INVENTORY OF MDSE. AT END OF PERIOD		.....		
13. NET COST OF MERCHANDISE SOLD			.....	.....
14. Profit on Merchandise			.....	.....
15. CASH DISCOUNTS TAKEN ON PURCHASES OF MERCHANDISE			.....	.....
16. Gross Profit on Merchandise			.....	.....
Expense Statement:				
Buying Expense				
17. SALARIES OF BUYING FORCE	.....			.....
18. OTHER BUYING EXPENSE	.....			.....
19. Total Buying Expense		.....		.....
Selling Expense				
20. WAGES OF SALESFORCE	.....			.....
21. PREMIUM MERCHANDISE ("PM's")	.....			.....
22. ADVERTISING	.....			.....
23. WRAPPINGS AND OTHER SELLING EXPENSE	.....			.....
24. Total Selling Expense		.....		.....
25. DELIVERY EXPENSE		.....		.....
Management Expense				
26. MANAGEMENT AND OFFICE SALARIES	.....			.....
27. OFFICE SUPPLIES AND EXPENSE	.....			.....
28. Total Management Expense		.....		.....

			Per-centage
Fixed Charges and Upkeep Expense			
29. RENT			
30. HEAT, LIGHT, AND POWER			
31. INSURANCE (Except on buildings)			
32. TAXES (Except on buildings)			
33. REPAIRS OF EQUIPMENT			
34. DEPRECIATION OF EQUIPMENT			
35. Total Fixed Charges and Upkeep Expense			
36. MISCELLANEOUS EXPENSE			
37. LOSSES FROM BAD DEBTS			
38. Total of Expense Statement			
39. Net Profit (or Loss) from Mdse. Operations			
Other Business Profits (or Losses)			
40. REPAIRING			
41. MISCELLANEOUS PROFITS AND LOSSES			
42. Total Other Net Profits (or Losses)			
43. Total Operating Net Profit (or Loss) of the Period			
Application of Total Operating Net Profit:			
44. INTEREST ON CAPITAL—BORROWED			
45. INTEREST ON CAPITAL—OWNED			
46. DIVIDENDS ON CAPITAL STOCK			
47. Total Interest and Dividends			
48. Final Surplus (or Deficit) for the Period			

See also p. 482. What the Profit and Loss Statement Shows.

26. MEASURING AIDS, QUOTAS AND BUDGETARY CONTROL[1]

That an accurate look-ahead is possible—that next year's sales can be determined in detail and prepared for, that the factory's work can be laid out and scheduled—I have proved to myself time and again.

Planning ahead for the coming year cannot start the last month of this year. It must be begun years before—a quarter of a century in our case. For a planning-for-next-year system must have the most accurate basis: figures—cold, hard, mathematical figures; and facts—proved, recorded facts.

[1] Taken by permission from M. W. Mix, "Planning Next Year's Business," *System*, XVI (1909), 253–57.

Our records of business run back for twenty-seven years; definitely tabulated as to sales by territories and lines of goods; as to production by costs and stocks on hand. That is the basis of our prophetic powers. Like the source of most things that look like genius, it is just—knowledge.

Planning ahead means first determining probable sales. For selling the goods is the last step in the process of manufacture, but the first is determining the amount to manufacture. No wisdom lies in preparing to make what can't be profitably sold.

The figures of last year's sales are the basis for judgment of next season's business. These figures are so tabulated that I know the exact sales made in each territory and through each agency, by lines of goods and by periods. Our goods are sold through two hundred and forty agents covering the whole country, through salesmen in our branch houses in the large industrial centers, and through salesmen working direct from the home office. Our sales are classified into thirty-eight different lines and are recorded under thirty-eight corresponding sales accounts.

A record of our sales is kept for each one of these various sales units classified according to these thirty-eight accounts. The first source of our records is the orders as they come in from the various agents and salesmen. These orders are classified and tabulated until they finally reach me in a concentrated form. One sheet is given to the record of each sales unit for one month, classified according to the thirty-eight sales accounts and tabulated so as to show comparisons with the previous month, with the same month the previous year, and with the total of the current and the previous year. The sheets for each sales unit are bound together in a pamphlet so as to bring together a complete record for a year.

But the figures alone do not tell the "why"; they show what is going on but they do not show the reason. So another source of information is necessary—information concerning business conditions, concerning developments in our trade and among our customers, concerning the circumstances and methods of our selling agents, concerning the circumstances that surround each transaction and each development in our business.

This nebula of facts and of human interest which envelops the selling end must be taken into consideration in judging the possibilities of business for next year. This information I glean from sales reports which come in every day from our salesmen and less frequently

from our agents, from various mediums of trade news, from personal observation and letters, and from special reports.

With these sources of information then—the figures of previous years' sales and the knowledge of trade conditions—the next year's sales quota is determined. Each unit of the organization is taken up in turn. With the comparative figures of previous years' sales before me, I call to mind the conditions in this territory and in this sales unit, determine what pressure for additional sales can be brought to bear, estimate what the conditions the coming year will probably be; then determine what increase all these factors are likely to bring and set a sales quota for this unit.

After all, I regard the most important point in planning next year's work to be, not the *determination* of the sale's quota, but the laying out of the actual *methods* we will pursue to help the agent sell his quota. Because much of our business is handled through agents, the agency is the first source of next year's business to be studied.

One of our special sources of information on the agent is an agency record, kept apart from the general sales records, where the facts regarding each agent are recorded. This card indicates at a glance what the agent's quota of sales has been for several years, how close he came to selling this amount, what the conditions in his territory have been, and any further general facts regarding him. The record also shows the definite aid in selling given him by the house—such as local advertising, circular letters, advertising literature—and what the cost of this advertising amounted to.

Now suppose we find from our records that we have sold a particularly large amount of some line in a territory. We find out the reasons, the methods by which these sales were made; if these can be duplicated we tell our other agents about them and we estimate how big an increase in their sales they should bring. If a certain line of local advertising or circular-letter work that we have done for one agent has proved successful, we duplicate it among other agents. If certain goods have proved particularly profitable, we give agents special methods for pushing them. And all these cases affect the quota finally determined.

Local conditions, of course, often govern big sales; they must be considered in the agent's quota. Certain local changes during the past year may have raised sales to a point which cannot be maintained; new conditions about to materialize may greatly increase the possibilities of sales.

With the sales quota determined in detail, the manufacturing quota for the year is easily fixed: it is simply the sum of the thirty-eight lines of stock, totaled from the sales-unit sheets. Manufactured stocks are carried in the records of the manager of manufacture under the same general groupings as in the sales accounts. Subtracting stock on hand from the sales quota of each line, therefore, tells the quantity of each product to be manufactured during the coming year.

This quota is, of course, not followed blindly by the factory; it serves rather to point the *direction* that next year's production will take. Its greater value lies in the basis it affords the manager of manufacture for systematizing his factory practice and reducing his costs. His sole object is to manufacture enough stock to keep sufficiently ahead of the sales demand that he will not be caught understocked, and yet not build on estimates so far ahead that there is liability of overstocking.

See also p. 354. An Organization of the Sales Department.
p. 831. Budgetary Control.

27. PRICE POLICIES: WHAT THE MARK-UP SHOULD COVER[1]

These rules for figuring costs and profits are recommended (1 and 2 regarded "debatable") by the National Association of Credit Men:

1. Charge interest on the net amount of your total investment at the beginning of your business year, exclusive of real estate.

2. Charge rental on all real estate or buildings owned by you and used in your business at a rate equal to that which you would receive if renting or leasing it to others.

3. Charge in addition to what you pay for hired help an amount equal to what your services would be worth to others; also treat in like manner the services of any member of your family employed in the business not on the regular pay roll.

4. Charge depreciation on all goods carried over on which you may have to make a less price because of change in style, damage, or any other cause.

5. Charge depreciation on buildings, tools, fixtures, or anything else suffering from age or wear and tear.

6. Charge amounts donated or subscriptions paid.

[1] Taken from A. M. Burroughs, *A Better Day's Profits*, p. 44. (Burroughs Adding Machine Company, 1915.)

7. Charge all fixed expenses, such as taxes, insurance, water, lights, fuel, etc.

8. Charge all incidental expenses, such as drayage, postage, office supplies, livery or expenses of horses and wagons, telegrams and telephones, advertising, canvassing, etc.

9. Charge losses of every character, including goods stolen or sent out and not charged, allowance made customers, bad debts, etc.

10. Charge collection expense.

11. Charge any other expense not enumerated above.

12. When you have ascertained what the sum of all foregoing items amounts to, prove it by your books, and you will have your total expense for the year; then divide this figure by the total of your sales, and it will show you the per cent which it has cost you to do business.

13. Take this per cent and deduct it from the price of any article you have sold, then subtract from the remainder what it cost you (invoice price and freight), and the result will show your net profit or loss on the article.

14. Go over the selling prices of the various articles you handle and see where you stand as to profits, then get busy in putting your selling figures on a profitable basis and talk it over with your competitor as well.

See also p. 335. Measuring Aids Reflected in the Profit and Loss Statement.

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28. PRICE POLICIES: THE TURNOVER[1]

Turns are easily figured by dividing the sales for any period, at cost, by the cost of the average stock on hand during the period. Once he has secured turnover and cost figures for his store, it is not difficult for the retailer to demonstrate the added profit which an extra turn will bring. The net gains climb when the expenses are cut, the turnovers increased, the totals owing from customers reduced, or the gross profits lengthened.

Investigation of the merchandising plans successfully used by merchants in five states shows that they are getting more turns in four ways: locating lines which move rapidly; weeding out the slow lines; setting stock limits; concentrating purchases with a few

[1] Adapted by permission from Wheeler Sammons, "More Turnovers" in *System*, XXV (1914), 236–39.

manufacturers or wholesalers. Some of these merchants are using only one or two of these methods, others all of them, but not one has discovered and tested a fifth plan.

Once the fast-turning, profitable lines are known, they are pushed and the stock on the shelves cut to the lowest limit. The quicker the stocks in these lines change, the more possible it is definitely to satisfy customers and operate on a small investment. Manufacturers frequently maintain in-stock departments for their fast-turning lines, and thereby enable retailers to buy day-to-day supplies.

The second plan for increasing turnovers is to weed out the lines which move slowly. Once the fast-turning stocks are tabulated, the less profitable lines immediately become evident. If these slow goods will not stand heavier mark-ups than the rapid lines, they are usually unworthy of shelf room. There are many lines which do not turn fast enough to warrant the retailer's investment, for depreciation gradually eats up the slender profit margins they offer. A huge sales volume might be built around these lines, and not a penny of net profit result. The stores which frequently go under when all is apparently prosperous are making this type of sales—their owners have not weeded out the slow lines.

Third among the tested methods used by the merchants working in four states for rapid turns are definite stock limits and plans. The best way to prevent over-buying, in the opinion of these merchants, is to fix the lowest stock which will satisfy demand and then place orders accordingly. This, again, is a stockkeeping problem.

There is one danger in buying too close, however. An Iowa variety store owner, who averages eight turnovers a year, mentioned it specifically, although the majority of the merchants seen by *System's* investigators referred to it. "Your profits are in buying close," he said, "but you are tempted to cut down your assortments, and that costs trade."

The fourth method for securing more turnovers is to concentrate the buying with a few wholesalers or manufacturers. To do so is helpful in two specific ways. First, there is less danger to the retailer of over-buying through duplication, and bookkeeping troubles are reduced. Second, the manufacturer or wholesaler is naturally unusually interested in the retailers who buy heavily from him. Especially in lines where style changes are important, co-operation between the retailer and the manufacturer is valuable to both Furthermore, the best "snaps" and the most favorable service go to the retailer who has concentrated his buying.

29. PRICE POLICIES: THE DETERMINATION OF MARKET PRICE[1]

One of the most important problems which confronts every business man is the question of what price he can obtain for his product. Many factors co-operate to determine the market price, and many of these factors are beyond the power of the producer to control. The mechanism of price determination varies with the degree of power of price control possessed by the producer and with the character of the market.

Economic theory has confined itself very largely to the exposition of the method of determination of market price in what economists call a perfect market, namely, a market in which there are many alert and experienced buyers and sellers; in which there is an effective organization for the purpose of mediating purchases and sales, recording prices, and diffusing important information with respect to present and prospective production and consumption and other factors bearing upon price; and in which there is no agreement among buyers or sellers, formal or informal, with respect to the prices to be bid or asked. Very few commodities have markets which possess all of these characteristics. It is not far from the truth to say that a few basic foodstuffs and raw materials produced under small-scale conditions and important securities widely held and traded on the stock exchanges in large amounts are the only commodities having perfect markets.

Market price, regardless of the character of the market, is always determined by demand and supply, i.e., by the willingness of buyers to buy and sellers to sell. In the perfect market, the buyers will stand ready to buy but in amounts varying inversely with variations in the price, and the sellers will stand ready to sell, but in amounts varying directly with variations in the price. If the price settles temporarily at a point at which the offers to sell are greater in volume than the bids to buy, price-cutting competition between sellers in their eagerness to make sales will force the price down. If, on the other hand, the price settles temporarily at a price at which the offers to sell are smaller in volume than the bids to buy, price-raising competition between buyers in their eagerness to buy will force the price up. The market price tends to settle at that point at which all buyers will be able to buy all they are willing to buy at that price, and all sellers are able to sell all they are willing to sell at that price.

[1] By J. Viner.

Any change in the demand or the supply, however, will change the location of this point of equilibrium. In a typical perfect market, such as the wheat market, the point of equilibrium is rarely constant even for an hour. News about the growing crops, of an impending war, of government plans to change the scheme of taxation, of heavy shipments of grain to market by farmers, affect demand and supply or the willingness of traders to buy or sell. Since, in a wholesale market, most of the purchasers are either made by middlemen who expect to resell to the actual consumer, or, if made by the consumers themselves, are in anticipation of future needs, any factor which affects the prospects of future prices will be reflected in a change in their present willingness to buy. Traders in the perfect market are constantly on the alert to get wind of prospective changes and any scrap of news, very often any rumor, will affect their willingness to buy or sell, and will, therefore, affect the market price. Since valuable information may reach some traders before others, they constantly watch each other's bids and offers. If a group of traders bid prices up and make large purchases at the higher prices, other traders, confident that there must be some good reason as yet unknown to them for this anxiety to buy, will also buy and thus force prices up still further. Similarly, a disposition to sell on the part of some traders will spread to others and lead to a fall in price.

A commodity is not suitable for large-scale and smoothly organized competitive trading unless it is by its nature homogeneous or is artificially standardized by careful and authoritative grading, so that it can be traded in by name without necessity of samples or bulk inspection. Price policy for the producer of a commodity which has a perfect market is a comparatively simple matter. He can sell only at the current market price, which is determined by the concurrence of a great many buyers and sellers. In the short run he has only two alternatives, to sell at the current price or to hold for a rise. In the long run, he must make guesses as to what the average future prices will be and adjust his production to the scale which would be most profitable at that average price. The outstanding characteristics of the perfect market price are, therefore, its quick responsiveness to changing conditions, its freedom from control by individual producers or buyers, and its uniformity at any one moment over the entire area of the market, if allowance is made for transportation costs.

The most complete contrast to the perfect market is presented by the monopoly market. In the strict sense of the term monopoly, a

commodity has a monopoly market when supply is controlled by a single producer or combination of producers. The monopoly producer has much greater control over price than does the producer for a perfect market. Within a wide range of prices, the monopoly producer will continue to make sales, although in varying amounts, if he varies his prices, whereas the producer for the perfect market will see his sales drop to zero if he demands a price higher only by a small fraction than that demanded by his competitors. It is not accurate to say, however, that the monopolist has complete control over price. As he raises his price, sales will fall somewhat. As he lowers his price, sales will increase somewhat, the degree of change in the volume of sales, as price changes, varying with the character of the demand for the commodity and the availability of substitutes. The monopolist is able to determine the price at which his product will sell, but if he is an efficient business man, he will endeavor to find the price at which profit per unit times total sales will yield him the greatest amount of total profit. He will also give consideration to the possibility that a price yielding a high profit will attract competitors into the industry or will lead to a demand for government interference with his industry. Monopoly price normally will remain constant for comparatively long periods and will be adjusted to changing conditions of costs of production or of demand by sharp changes at infrequent intervals. The outstanding characteristics of monopoly price are, therefore, its slowness of response to changing conditions and the great degree of control over price exercised by the producer.

Between the perfect market and the monopoly market there is for wholesale markets, a gradation from those which closely resemble but not fully approach free and energetic price competition to those which closely but not fully approach complete monopoly control over price. Producers always desire as full a measure as possible of control over the prices of their products. They fear price competition, because with the importance in modern industry of direct or overhead costs, price-competition always threatens to become cut-throat competition. Moreover, they dislike frequent fluctuations in price. They seek every possible means, therefore, of withdrawing their products from the field of keen price competition, and in pursuit of this end they use a variety of devices such as special brands, trade marks, patents, style differentiation, even different methods of wrapping or different containers, to differentiate their products from those

of their competitors. If they succeed in developing a special demand for their products, such producers find that to some extent they can determine their prices independently of the prices of their competitors and still maintain their sales. The importance of advertising to producers of commodities only slightly differentiated from competing articles is obvious. Competition between such producers tends more and more to become competition in sales efforts, such as special displays, number of salesmen, volume of advertising, and tends to refrain from price-cutting as a means of stimulating sales. Specialized commodities of this kind tend to be less responsive in their price to changing conditions of production or consumption than perfect market commodities, more responsive than monopoly products; their producers can exercise more control over their prices than producers of commodities for a perfect market, less control than producers for a monopoly market; the products are not standardized as between producers as compared with perfect market commodities; they are not as much differentiated from rival commodities as are monopoly commodities.

The methods of differentiation—or specialization—of products discussed in the preceding paragraph generally can be applied successfully only to consumers' goods, where the purchasers are not sufficiently skilled or sufficiently interested purchasers to discover the substantial identity between rival products. Industries producing fairly standardized raw materials or intermediate products often avoid keen price competition by another method which may be called the follow-the-leader method of price determination. This method is most likely to occur in industries where one producer controls a large fraction of the total production and enjoys strong financial backing. The leading producer will determine the prices for his own products, and will issue a price list several times a year. The smaller producers, without any formal or informal agreement, will adopt this price list as their own. If they should not do so but should charge higher prices, they will make no sales so long as the leading producer and other producers adopting its scale of prices are able to accept additional orders. If they charge lower prices, they face the danger that the leading producer will under-cut their prices, and with his greater financial resources, will be able to force them into bankruptcy. The smaller concerns will often welcome the leadership of a strong producer in setting prices, as they are glad to escape price competition and feel that they can rely on the superior facilities

of the leading producer for gathering information to make the prices fixed upon those most profitable for the industry as a whole. The leading producer by this method gains most of the advantages of monopoly control while avoiding the expense of eliminating competitors and the danger of governmental interference and of public resentment.

The retail market differs from all of these markets in that owing to its lack of organization and to the lack of skill, alertness, and information on the part of both buyers and sellers, prices differ from store to store on the same day for absolutely identical articles, and reflect only slowly and imperfectly changing conditions of production and consumption.

30. PRICE POLICIES OF THE DISTRIBUTER[1]

The producer who today enters the market to manufacture and sell a commodity in competition with other producers of substantially identical products has open to him three general price policies. He may adopt one of these to the exclusion of the others, or may use them in combination.

These three policies may be termed: (1) selling at the market minus, (2) selling at the market, and (3) selling at the market plus.

1. *Selling at the market minus* is that policy which aims to increase sales by reducing price. The distributer who markets his product at a price range below that established for the identical commodity as sold by other producers not only attracts consumers from other distributers but also brings into the market as consumers certain of those whose demand was before unexpressed because the price level established for the commodity was above that warranted by their subjective valuation on the commodity.

This policy does not ordinarily involve a differentiation of the product from the stock product of like nature, nor the use of trade marks, brands, or trade names. The producer depends upon increased sales to give a reduced proportion of overhead expense and reduced costs of large-scale production, thus increasing his area of profit. The producer appeals to the consumer mainly through the difference in price level. Hence, the successful pursuit of this policy in a competitive market over a long period involves a continuing ability to sell the commodity for less than the price at which other producers of substantially identical products are willing or able to market them.

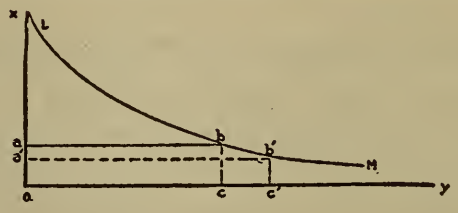
[1] Taken by permission from A. W. Shaw, "Some Problems in Market Distribution," *Quarterly Journal of Economics*, XXVI (1912), 712–18. Later published in *An Approach to Business Problems* (A. W. Shaw Company, 1916).

[It is obvious that this policy secures its best results when (*a*) the demand is elastic, which means that with relatively slight change in the price there is a relatively large increase in the amount demanded and (*b*) when the increased output can be made at a lower cost per unit. Notice the influence of indirect cost in this latter consideration.]

The working of this policy, especially as to bringing new consumers into the market, is shown graphically in Chart I.

CHART I

SELLING AT THE MARKET MINUS



This chart attempts to show graphically the operation on the demand side of the market of the price policy termed "selling at the market minus." On the ordinate OX is laid off a scale of prices for the commodity. On the abscissa OY are laid off the number of purchasers. The arc LM shows the number of purchasers at a given price, growing fewer as the price increases and greater as the price decreases.

Now if OA represents the prevailing market price for the commodity, and OC the number of purchasers at that price, it is apparent that if the price is reduced from OA to OA′, the new consumers will be brought into the market and the number of purchasers at the price OA′ will be OC′, a number greater than OC.

It is somewhat in this fashion that the policy of selling at the market minus operates but the chart does not indicate the important element that other producers are selling at a higher level, and hence customers are attracted from them, as well as new customers brought into the market.

2. *Selling at the market* has been the policy perhaps most characteristic of our scheme of distribution during the period when the stress was on production. It is still a common policy in the marketing of staple goods.

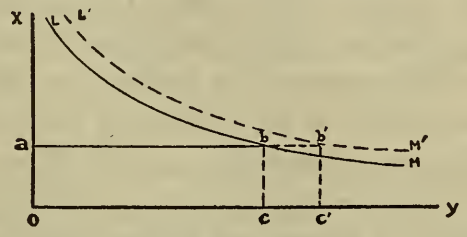
This policy consists briefly in the acceptance of the market price existing for the commodity as a fixed condition. The producer does not seek to attract purchasers by maintaining a price level somewhat lower than that at which other producers of the same commodity are willing to sell, nor does he attempt to establish his commodity upon a new and higher price level as a distinct commodity. He

recognizes the market price for such a commodity as something objective, and sells his commodity at the established level.

The acceptance of this price policy leaves open to the merchant-producer two general methods of increasing his area of profit. He may devote himself to a reduction in his cost of production by a better organization of his plant, or he may seek to increase his sales, thus giving economies of large-scale production and a reduced proportion of overhead expenses.

CHART II

SELLING AT THE MARKET



This is an attempt to show graphically the effect of a stimulation of increased demand for a commodity without any increase in the price at which it is marketed.

The ordinate OX is a scale of increasing price. The abscissa OY shows the number of purchasers. The arc LM indicates the number of purchasers at any given price, growing less as the price is increased and greater as the price decreased.

If the established market price is represented by OA, the number of purchasers at that price will be represented by OC. If then by stimulating an increased demand for his product, the merchant-producer is able to increase proportionally the number of purchasers at each price level, the demand curve LM will be replaced by L'M', and at the price, OA, a greater number of purchasers, OC', will purchase.

This chart does not, of course, show how customers already in the market are drawn from other merchant-producers to the purchase of a differentiated product for which a demand is stimulated at the same price level as the products of the other merchant-producers.

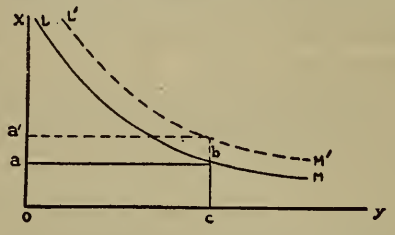
If the merchant-producer adopts this second method, he must, in general, differentiate his product from that of his competitors and build up a demand for his particular product. To do this he must depend upon the same means that would be used to establish his product as a distinct commodity upon a higher price level. Trade marks, brands, and trade names, coupled with niceties of finish, evenness in quality, or more convenient packages, serve as the basis for an increased demand for the commodity upon the same price level as substantially identical products. When selling at the market, superior promptness in delivery may become a factor of great importance in increasing sales.

3. *Selling at the market plus* is perhaps the most characteristic price policy of modern distribution. The exceptionally able distributers have in recent years turned more and more to this policy. They refuse to accept as a fixed condition the market price for the commodities similar to those which they produce. They isolate their product, and establish it, practically as a new commodity, on a different price level.

The whole basis of the policy is the differentiation of a product from other goods of substantially like nature by improvements, minor or substantial, and the identification of the product by trade marks, brands, and trade names. This done, the producer stimulates a demand for his product by calling attention to stability of quality, niceties of finish, improvements in package, or like modifications. He appeals to that portion of the consuming public whose subjective valuation upon the stock commodity has left them a so-called "consumer's surplus" over the market price. The differentiated commodity is established on a new and higher price level, and is, to all intents and purposes, a new commodity.

CHART III

SELLING AT THE MARKET PLUS



This chart illustrates the effect of the price policy termed "selling at the market plus." On the ordinate is laid off a scale of prices for a staple commodity. The abscissa shows the number of purchasers.

The demand curve LM indicates the number of purchasers at a given price, growing less as the price increases and greater as the price decreases. Then if OA represents the market price of the staple commodity, OC will represent the number of purchasers. Now if the merchant-producer differentiates his product from the staple commodity and stimulates a demand for it, the effect is to increase the number of possible purchasers at each price level. Thus the demand curve LM is replaced by the demand curve L'M'.

Obviously the merchant-producer may dispose of the differentiated product at a price OA', higher than the price OA, without reducing the number of purchasers, OC. In other words, he can profit by the increased demand through raising his price rather than by increasing his sales.

Chart III shows graphically the operation of the price policy termed "selling at the market plus."

31. PRICE POLICIES: PRICE MAINTENANCE[1]

["Price maintenance," says Cherington, "is the arrangement by which manufacturers of identified merchandise, made and sold under competitive conditions, agree with some or all of the distributors of this merchandise concerning the price at which it is to be re-sold." Obviously enough this is one of the devices that modern business men have adopted as a means of securing greater stability in their market relations. Considerable question has arisen concerning the legality of such agreements. The following selection shows the form of notice and agreement which Robert H. Ingersoll and Brothers print upon the boxes in which the Ingersoll watches are sold. It is particularly interesting in that the attempt to phrase the agreement so that it will be legal stands out in a very obvious fashion.]

In selling this watch to the dealer we withhold from him the right to use or refer to our name, trade mark, guarantee, reputation or selling helps in connection with selling, offering, advertising or displaying for sale this watch, unless and until the dealer (1) shall have agreed that he shall not so sell, offer, advertise or display this watch with our name, trade mark or guarantee attached, nor so use or refer to our name, trade mark, guarantee, reputation or selling helps as to injure us unlawfully in our good will or other property, and (2) shall have admitted for all purposes that selling, offering, advertising or displaying for sale this watch (if our name, trade mark, or guarantee be attached, or our name, trade mark, reputation, guarantee or selling helps be used or referred to) at any other retail price than $2.50 (including Revenue Tax), or with or as any donation, discount, rebate, premium or bonus, depreciates our good will and other property, and (3) shall have agreed that we shall have the right, upon our written request (unless the dealer shall have previously sold this watch), to repurchase from him this watch, if then merchantable, at our ruling trade price therefor, or if this watch shall then be damaged, at such prices as shall then be agreed upon. Upon written request of any dealer we agree (*a*) to sell to him, at our ruling trade price for this watch, a duplicate of this watch (withholding from him, however, the right to use or refer to our name, trade mark, guarantee, reputation or selling helps), which duplicate watch shall not bear our name, trade mark, or guarantee, but which duplicate watch the dealer may

[1] Taken from the *Notice and Agreement* used by R. H. Ingersoll and Brothers.

sell or otherwise dispose of as he pleases, provided that in so doing he refrains from using or referring to our name, trade mark, guarantee, reputation or selling helps, and (*b*) to repurchase from the dealer this watch, if then merchantable, at our ruling trade price therefor, or if then damaged, at such price as shall then be agreed upon.

By selecting to purchase, sell, offer, advertise or display for sale this watch with our name, trade mark or guarantee attached, instead of a duplicate watch without our name, trade mark and guarantee, the dealer agrees that he may use or refer to our name, trade mark, guarantee, reputation or selling helps only upon agreeing to the terms and conditions stated in (1) and (3) above and admitting for all purposes the facts and conclusions stated in (2) above, and then only for the purpose of selling, offering, advertising or displaying for sale this watch, and the dealer expressly agrees to be bound by said terms, conditions, and admissions. The dealer may sell or otherwise dispose of this watch as he pleases, after first removing this Notice and Agreement, and our name, trade mark, and guarantee, and returning to us our selling helps, and refraining from using or referring to our name, trade mark, guarantee, reputation and selling helps, but he has no right to use or refer to any of them in violation of said terms and conditions, nor to injure us unlawfully in our good will or other property.

32. THE ADMINISTRATION OF SALES AND ADVERTISING[1]

The feature of the problem of sales-force organization which particularly appeals to us in this discussion is the question: How is the sales force, either good or bad, to be co-ordinated with the advertising activities?

Consideration of this question soon shows us that it has two distinct parts: (1) How is this co-ordination to be brought about in the actual operations of selling and advertising? and (2) How are these two separate departments to be organized so as to be administered without conflict? One part deals with co-ordination "on the road," where the sales are made, and the other deals with co-ordination "in the office," where the sales are planned.

[1] Adapted by permission from P. T. Cherington, *Advertising as a Business Force*, pp. 295–323. (Doubleday, Page and Company, 1913.)

The American Multigraph Sales Company, makers of the "Multigraph" light printing device, has had particular success in its efforts to secure co-ordination between the advertising and selling departments.

Some time ago change was made in the sales management of the American Multigraph Sales Company. For eighteen months before that time there had been no advertising manager. The sales manager and advertising manager could not pull in double harness. The advertising manager quit. A successor was not appointed during the remainder of that sales manager's connection with the company.

The new sales manager looked at things in a different light. He believed that the business required an advertising executive as well as a sales executive; that perfect team work between the two was essential and possible; that the sales manager should be, in a sense, assistant advertising manager and the advertising manager assistant sales manager; that with the work of each clearly defined there should be no confusion, and that with this kind of a working arrangement the business would develop as never before.

With the beginning of the new régime a series of sales contests was started. The origination, as well as the details of carrying out these contests, was left to the advertising manager. Each month he submitted his suggestions to the sales manager and a conference was held on them.

In order that the advertising manager might be kept fully informed on the progress of sales, he was given the same weekly sales reports that the general sales manager received and made acquainted with all conditions in the field. It was realized at the outset that unless he was fully informed on all sales conditions he could not thoroughly analyze them.

F. Manning, the general sales and advertising manager of the Grape Products Company, of Northeast, Pennsylvania (makers of Walker's Grape Juice), contends that the sales and advertising managerships should be one. "Selling" and "advertising," while seemingly considered as two separate branches of business endeavor and expense, are, in fact, inseparable units of the same thing, "salesmanship." And while the actual taking of orders may be directed by one head, and the advertising of the article covered by these orders may be directed by another to good effect, the fact that these two great selling forces, directed at the same objective and being each dependent upon the other, so similar in character and results, should

certainly indicate *consolidated* management, just as do the various branches of manufacture. One rarely encounters a factory in which all the various divisions of production are not directed by a single head—under supervision, perhaps, but with one center of management and responsibility. This being the case in manufacture, why should the combined selling effort be handled as two separate branches of the business organization?

Advertising is as dependent upon the selling for results as the salesman is dependent upon advertising for consumer demand with which to interest the retailer and secure prestige with the jobber. No dealer, whether retailer or wholesaler, buys an article simply upon its *merit*—he buys upon *salability* first, price and profit next, and *then* he may be interested in quality.

But a ready sale, a steady consumer *demand*, is always the first thing he considers in the purchase of goods for sale. This premise granted, why should not the same head direct both the element needed to secure signed orders—the ultimate result? This necessitates a close interlocking of the sales and advertising details—call for team work of a high order—and the success of its execution determines the exact generalship exercised in the carrying out of the composite "sales" and "advertising" campaign. And generalship means profit, efficiency, distribution, and lasting results.

Therefore, in selecting the sales advertising head, the question of choice should be determined by the qualifications of the individual, rather than by whether he be a salesman or an advertising man. But the direction of these features of the business should certainly be centered in one man.

33. AN ORGANIZATION OF THE SALES DEPARTMENT[1]

[The following material is taken from the preliminary reports of two committees of the Taylor Society. It is interesting not only as a sketch of an appropriate organization of a sales department but also in its position "that planning and performance are the two major functions in distribution as well as in fabrication."]

Selling seems to break down into two major functions, distinct in their nature and in the types of personnel required for their performance:

I. The making of larger plans for the marketing of a products involving analysis of the market and the product, the preparation,

[1] Adapted by permission from *Bulletin of the Taylor Society*, V (1920), 236–43.

of master schedules, and the co-ordination of production, financial and selling resources called *Sales Engineering*, Sales Planning, Merchandising, Merchandise Control, etc., and in many instances cared for by advertising or selling agencies.

II. The actual conduct of the selling operations, involving the detail planning of selling operations, the selection, training, and direction of the sales force, the detail planning and conduct of selling operations when salesmen are not used, and all contacts with the customer; called in this report *Sales Operating*.

The sales engineering function presents at least three distinct phases: (*a*) field research; (*b*) technical assistance; (*c*) master planning and scheduling.

a) *Field-research activities.*—As a field research function, sales engineering should make its services available for all parts of the plant organization. Some specific things it can usually include in its research activities are:

1. Products: to be added; to be eliminated; changes; standardization; present uses; new uses; seasonal factors; territorial factors; trade reactions; competitive products.

2. Marketing policies and methods: present trade channels; potential trade channels; trade customs; trade reactions; competitors' activities; standardization; containers and packing; quotas and statistics; prices and margins; present markets and volumes; potential markets and volumes; assistance to customers; salesmen's training; warehouse and branch locations; trade organizations.

3. General research: administrative and management problems; research for all operating departments.

b) *Technical activities.*—The personnel of sales engineering should be such that it can be of technical assistance to the entire business organization. While sales engineering utilizes and contributes to the entire resources of the business organization, it is essential that no duplication of effort be brought about by the segregation of this major function; in fact, this segregation of sales engineering should invariably tend to diminish duplication of work.

The range of research and other activities involved in sales engineering is indicated by the following synopsis; it is possible that in a large organization some of them may assume such importance as to be recognized as separate functions:

1. Products: study selection and standardization of types and sizes, materials, finishes, markings, packing.

2. Advertising: furnish data on new products, product changes, new uses, new markets, trade reactions, competitors' activities, prices, trade customs, seasonal factors, territorial factors.

3. Selling: furnish data on prices and margins, salesmen's compensation, selling equipment, seasonal factors, territorial factors, trade resistance, economics factors or trends.

4. Sales service: ascertain deficiencies, suggest remedies, suggest other service activities.

5. Markets or sales fields: report changes, discover new markets, suggest new policies or methods.

6. Competitors' activities: watch and report and suggest methods of combating.

7. Trade organizations: report activities, report probable effect on sales policies, determine possibilities of co-operation.

8. Legislation: watch and report and suggest necessary action.

9. Merchandise stocks: regularly check and report and suggest necessary action.

10. Patents and copyrights: watch and report and suggest necessary actions.

11. Statistics: suggest necessary compilations, analyze and report changes or trends, and interpret and suggest necessary action.

12. Complaints: analyze, compile records, and suggest necessary action.

c) Master planning and scheduling.—Sales engineering should become the co-ordinating function of the entire business. In this field it can relieve the administrative and managerial executives of many of their most troublesome and time-consuming problems. In this activity sales engineering should strive to be months ahead of any of the operating divisions. Only thus can the purchasing, financial, personnel, and production divisions have adequate time to plan for their respective activities. (See p. 831. Budgetary Control.)

The synopsis below is only to suggest some of the steps in a master plan and schedule. The variations necessary to meet the problems of specific industries are almost infinite.

1. New products: plan types, sizes, materials, finishes, markings, and packings.

2. New and old products: plan and schedule initial requirements; plan and schedule yearly and monthly requirements; plan and schedule general marketing policies and methods; plan and schedule

sales service activities; plan and schedule general advertising policy; state seasonal and territorial limitations; plan and schedule general activities of each division affected by project to establish order of work and definite responsibilities; plan and schedule warehouse distribution; plan dealers' selling equipment; plan salesmen's selling equipment.

II. Sales Operating seems to break down into two principal functions:

a) The detail planning for, the preparation of materials for, and the supervision and control of, all elementary selling processes. (This function breaks down into elementary functions or processes.)

b) The actual conduct of sales operations in accordance with the planning and control established in (*a*) above. (This function also breaks down into elementary functions and processes.)

This report is concerned with (*a*) only; investigation of (*b*) is to come later.

The accompanying chart sets forth briefly the general scheme.

1. General Administration determines or approves all general policies and plans, including general sales, production, personnel and financial policies and plans.

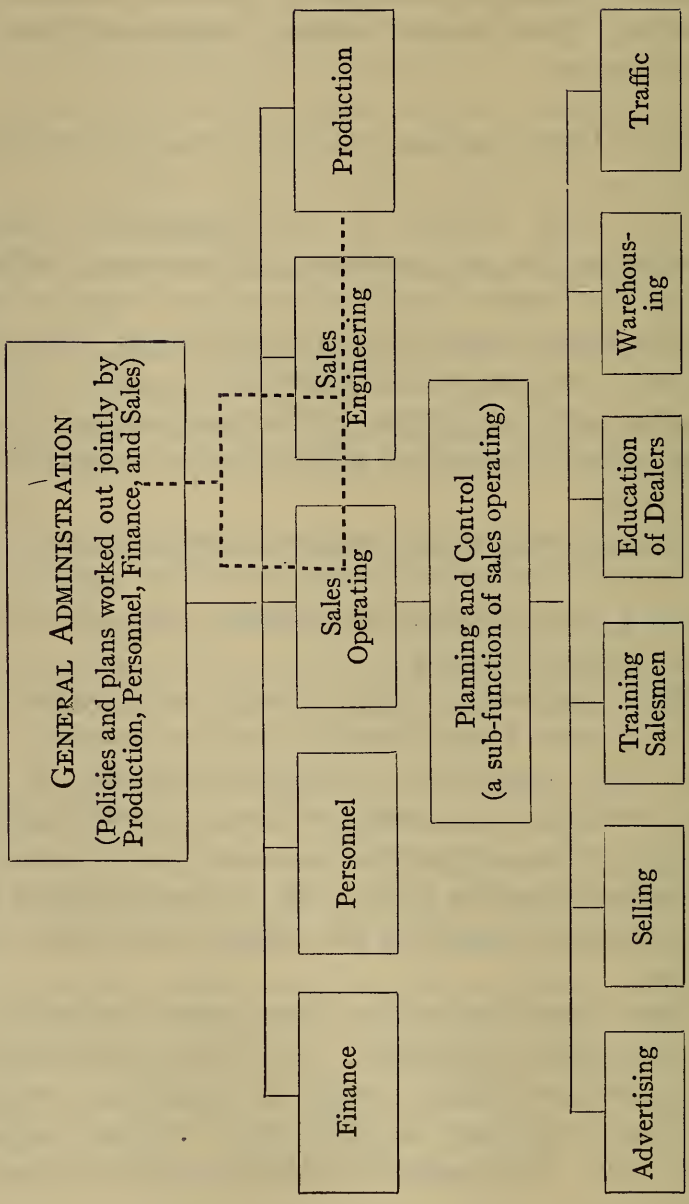
2. Sales Engineering studies markets and products and recommends to General Administration general or specific, continuous or limited, sales campaigns. Its recommendations, as adopted by General Administration, take the form of general schedules which co-ordinate selling, production, personnel and financial operations. These general schedules pass to the various operating departments for execution, and constitute the master task for their co-ordinated execution.

3. Sales Operating receives these general schedules, or master task, and proceeds to execution. The first step is planning details of execution and establishing controls for execution; breaking the task up into elementary tasks for performance by functionalized branches or individuals. The elements of planning and control are emphasized on the chart.

After detail operating schedules, orders and instructions are prepared; these pass to those respectively responsible for their execution in detail: advertising, selling, training, warehousing, traffic, etc.

It is interesting to compare production functions with selling functions.

CHART SKETCHING A SCHEME OF SALES ORGANIZATION



I. PRELIMINARY

Before the first step of actual selling is taken, a sales plan, general or specific, continuous or limited, is approved by the administrative authorities. This plan should have been worked out by some part of the organization, based on a detailed research into market conditions, study of the product, financial and production resources, etc. The part of the organization which has prepared this plan may have been certain delegated executives or a Sales Engineering Department termed as such or perhaps as a "Sales Planning Department," a "Merchandising Department," or a "Merchandising Control Department."

This approved plan takes the form of what may be termed "Master Schedules," which instruct and co-ordinate production, finance, and selling.

In the Taylor System of production the Engineering Department first prepares drawings for the product and for special machinery, tools, dies, etc.; and prepares lists of materials, specifications, etc.

II. SALES OPERATING

Having been provided with the approved general sales policy (master sales schedules) which it may have had a share in formulating, the Sales Operating Department plans its work of execution, first providing for control of execution in order to assure precision in its work.

The first major function of sales operation is, therefore, planning the operations and their control.

This planning and control function divides naturally into (1) analysis, (2) making sales schedules, (3) carrying out the detail schedules, (4) checking results, (5) improving methods.

In the Taylor System of production the production order, accompanied by the drawings, lists of materials, etc., goes first to the Planning Room.

1. *Analysis.*—(*a*) Analysis of the information gathered by the preliminary survey concerning the market, the product, competitive products, service that the product and the organization may render to customers, etc. From this analysis results:

b) The laying out of a definite procedure for the sale and distribution of the product. This includes the plan for the extent and composition of the elements that are to constitute the selling organization including its field executives and salesmen.

c) Information is classified and a list prepared of the supplies, equipment, and samples or stock required by the several units which are to carry on the selling and distribution of the product.

d) Responsibility and method is determined upon for the selection of supervisors and salesmen, their training and assignment to territories and duties, also for the education of dealers, and distribution of the product to branches, to customers direct or through general distribution centers or warehouses.

e) Analysis for the purpose of such preparation is followed by continuous analysis of performance based on summaries of branch office and Home Office records, from the angles of sales volume, distribution as to territory and as to commodities, and facts and figures presented by the financial, production, and sales engineering departments.

These may result in:

f) Periodical recommendations concerning changes in the method of selling, distribution, or of remuneration of various elements of the sales force; possible changes in the general sales policy or at least in its application, also possible changes or improvements in the product itself.

In the Taylor System of production the first process in the Planning Room is analysis of the production order and the specifications by the Production Clerk, who lays out a general plan of production, and is responsible for subsequent processes in the planning room, and for modification of plans to meet emergency situations.

2. *Making detail schedules.*—(*a*) To execute the sales plan laid out as a result of the analysis outlined, detail schedules are prepared.

The various processes referred to are timed so as to properly co-ordinate, and are possibly charted graphically.

Thus it is decided, based materially as to the time when necessary product and finances are to be available, when advertising begins; its volume and character; when the training of field executives and salesmen is to begin; the extent of such training; when shipments to warehouse or agency are to begin if the plan provides other than direct shipment to customers on actual sale orders, etc.

In this way a detail schedule is laid out for each operation which forms part of the general marketing plan.

b) Instructions in detail, and the supplies of all kinds that they require, are prepared and assembled for the carrying out of every planned step. These include instructions for each unit, such as the

field instructors, supervisors, agency managers and salesmen. Also material for the instruction of salesmen and of dealers; advertising material; material for service to dealers or customers; arrangement of selling territories and salesmen's routes; provision for samples and expense funds, etc.

In the Taylor System of production a corresponding function is performed by the Route Clerk, who makes route charts, route sheets, prepares purchase orders, instruction cards, move-material and work-order slips, but does not issue them or start work on the production order.

3. *Carrying out the detail schedule.*—The detail work of planning having been completed, the actual work of marketing the product is started, under the supervision and control of the General Sales Manager.

a) Field executives, if required, are selected.

b) With their assistance, otherwise by the sales operating department heads delegated for the duty, salesmen are selected.

c) Instructions and supplies are issued to the training section and training begins.

d) Assignment to territories is made at time of selection, or as the results of the training course develop.

e) Samples, advertising matter to be carried, order and report forms and other supplies needed are issued to salesmen and they begin work. Expense funds are established at the same time.

f) As provided by the time schedule determined upon, instructions are sent at the proper time to the traffic and shipping department or warehouses, advising them what initial stock shipments to make or advising them to be in readiness to execute any certain predetermined plan of executing orders for stock or delivery on sales.

g) In like manner activity is started among all operating units.

In the Taylor System of production a corresponding function is that of the Order of Work Clerk, who takes the move-material and work-order slips previously prepared by the Route Clerk and issues them; i.e., starts work. He arranges the order of work and keeps a balance of work record; he arranges who shall do what, and when, in accordance with the plans.

4. *Checking results.*—Results are assured only by constantly checking performance against plans—actual sales against estimated sales or quotas, costs of selling against estimated costs, etc., not only as to totals but as to each operating unit or section of territory.

a) The reports of the work of the various operating units, and particularly of each branch, dealer and salesman are secured for reasonably short periods that can be compared with corresponding periods. These are tabulated and summarized and compared, performance against plan, and performance against previous performances, and supplied to both administrative executives and executives in charge of units concerned.

b) Costs as shown by reports from field executives, branches and even salesmen, and figures supplied by the auditing and accounting departments are tabulated, summarized, set over against budget estimates and previous costs, worked out in actual amounts and in percentage as to sales. These and similar reports and statistics are supplied to the administrative heads of the business and to the heads of the field activities concerned.

In the Taylor System of production the corresponding functions are performed by the Progress Record Clerks, and the Cost Clerks, who check progress and costs as work is performed; and by the inspectors in the shop, who inspect for quality and quantity.

5. *Improving methods.*—Aside from the analysis first referred to, and the checking of results, there are in many organizations provisions for the improvement of methods, such as:

a) Investigations for improving selling technique—methods of personal salesmanship, demonstrations, preparations of selling portfolios by salesmen themselves from material and testimony secured from the consumer or dealer; methods of service to customers, etc. Even time studies of sales operations are being made.

b) Investigations for determining rates and also methods of remuneration, especially if a commission plan, or salary and bonus, or any other form of compensation is in use or under consideration whereby the amount earned is affected by the sales performance of the individual.

In the Taylor System of production this function is performed by specialized investigators—methods, time study and rate setting specialists.

See also p. 624. Control of Manufacture under the Taylor System.

D. The Work of the Purchasing Agent

It is a quite general error to regard the work of the sales manager as *the* relationship of the manager to the market. Such an error is easily committed in a period when the manager is eagerly seeking

markets in which to dispose of his goods. Perhaps it is even more easily committed in view of the fact that sales are the great source of income for the ordinary business and accordingly sales assume great significance in managerial eyes.

In point of fact, however, purchasing activities are as truly manifestations of the manager's relationship to the market as are sales activities. They ought not, furthermore, be so frequently crowded from the center of the stage of managerial thinking by the somewhat overweening sales function. They are as truly one of the key activities as is sales. In a way, this fact is recognized by a familiar saying in commercial businesses: "Well bought is half sold." That the fact is coming to be recognized in manufacturing and indeed in other businesses, is shown by such symptoms as an increasing interest in the function, by a developing literature, and by the establishing of associations of purchasing agents. In these days of search for lower costs of production and of emphasis upon standardized equipment the purchasing agent may make great contribution to business profits by getting the "right goods to the right place in the right quantities at the right time."

It is not necessary for us to review market functions and market structures in connection with our survey of the work of the purchasing agent. It will be sufficient to get a general view of his functions (see Selections 34, 35); to see the use of experimental and scientific methods as opposed to old "rule of thumb" and unfounded "opinion," or opinion based on custom and tradition (see Selections 36–38); and to secure an appreciation of the rôle of the purchasing agent in the business organization as a whole (Selections 34, 39–41).

PROBLEMS

1. "The principal elements of a purchase are: (1) specification of what is wanted; (2) requisition for a specific quantity; (3) official sanction for the purchase; (4) obtaining bids, with or without samples; (5) accepting bid and ordering; (6) receipt of purchase, with or without examination or test; (7) checking, passing, and paying invoice; (8) entry of purchase invoice in appropriate journal form." Who handles each of these in a business organization?
2. "Close buying is less important than intelligent buying and handling." Explain.
3. "Time is sometimes of greater moment than either price or quality." Explain, and enumerate some such occasions.
4. "Not only must the cost of the supply itself be taken into account; the cost of placing the supply in operation is also a factor in the situation." What would the latter cost involve?

5. "Successful purchasing is not a question of picking the lowest bidder, but of carefully comparing values." What does this involve?
6. "The modern tendency to replace rule of thumb in management by foresight and exact measurement has developed the use of specifications." What is a specification? How is it made? By whom? Should the purchasing agent take part in the preparation of specifications?
7. Enumerate the advantages (*a*) to the buyer, (*b*) to the seller, of buying by specifications. Can specifications be used for all purchases?
8. "A rational specification crystallizes buying policy at many points. It states, for instance, the method of sampling, tells how much material one sample shall represent, prescribes methods of testing, either in whole or in part, the size of the test samples, and how to forward samples." Can you think of anything else that should be included?
9. "The use of standard specifications is comparatively common; the proper following up of these specifications is comparatively common; comparatively rare." What is the inevitable result of such conditions? How should proper inspection be made?
10. "In the placing of a large order, the credit rating of the seller is as important as that of the buyer." Why?
11. What are the advantages to buyer and seller of the following terms of purchase: (*a*) single contract for one lot; (*b*) periodic deliveries of at agreed prices; (*c*) periodic deliveries at prices current at time of contract; (*d*) deliveries at the then prices between fixed limits; (*e*) deliveries at cost plus an agreed per centum.
12. What determines the choice of purchasing policies (*a*) as between dealing primarily with a few houses in each line, or shopping the entire market; (*b*) as between purchasing regulaily from certain suppliers or changing about; (*c*) as between placing an order entire, or splitting it into small parts; (*d*) as between buying from jobbers or from manufacturers?
13. "The shrewd buyer must look beyond the mere price and must reach into the causes which have made the price, and those that are material to its remaining at that point, or in causing its fluctuation up or down." Where will he get this information?
14. How far is it a part of the purchaser's problem to have access to the following records of stores and production departments: (1) materials disbursed; (2) balance of each kind of material on hand; (3) materials required for present and future production orders; (4) condition of stock on hand; (5) performance records of various materials?
15. Is it just as possible to err in setting quality standards too high as it is in setting them too low? If so, is it as serious an error?
16. In what specific ways is the purchasing department connected with the following departments: accounting and cost, sales, stores, designing and engineering, production, financial, legal?

17. Distinguish stock and stores.
18. "The stores problem is in essence a problem of stores control." Explain. What do you understand by control of stores? Is it paper control, safe-keeping, or something else?
19. What are the consequences of excess of stores beyond reasonable provision? What of a deficit of stores? How can over-investment in stores be prevented?
20. What items enter into a decision concerning how much stock to keep on hand? What variables may upset the calculation of stock limits?
21. "Stocks and stores are reserves for contingencies. They provide elasticity in manufacturing operations and this elasticity is frequently better carried by them than by some other phase of manufacturing operations." Explain.
22. "In deciding almost any problem of whether to buy or to make, certain advantages will suggest buying and others home manufacture." What considerations are at stake?
23. As you think back over the preceding questions, what are the requisite natural qualities and the desirable training and experience of a purchasing officer?
24. What do you think of the organization plan of a large manufacturing and selling business which provides for a vice-president in charge of marketing and places under his charge purchases, traffic, sales and advertising? Wherein is the plan good? Wherein defective?
25. Draw up an outline of the main points in this section.

34. THE FUNCTIONS OF THE PURCHASING DEPARTMENT[1]

There are really three main divisions of the work connected with purchasing, these being:

1. *Information*, which includes:
   a) Obtaining information as to sources of supply
   b) Recording data of past purchases
   c) Recording prices and quotations
   d) Keeping results of inspections and tests
   e) Maximum and minimum quantities and future needs
2. *Purchases*, which is subdivided into:
   a) Work connected with requisition
   b) Obtaining quotations
   c) Placing orders and following up

[1] Adapted by permission from H. B. Twyford, *Purchasing Its Economic Aspects and Proper Methods*, pp. 41 ff. (New York: D. Van Nostrand Company, 1919.)

3. *Invoices*, which is subdivided into:
   a) Recording and checking with order
   b) Checking prices, classifying, etc.
   c) Approving and passing to accountants

There is other work which is in some cases included in purchasing department, and in others is entirely separate. This work is connected with:

4. *Traffic*, which is subdivided into:
   a) Seeing that shipments are properly classified
   b) Seeing that correct freight rates are obtained
   c) Seeing that no delays occur in transit
   d) Getting quick adjustment of claims
5. *Inspection*, which includes:
   a) Inspection of material before or on arrival
   b) Making physical and chemical tests
   c) Reports on material in shop and in the finished products
6. *Stores*, which is subdivided into:
   a) Receiving material and supplies
   b) Storing in secure and proper places
   c) Delivering for consumption as needed
   d) Keeping proper and reliable accounts

35. BUYING FOR RETAIL HARDWARE STORES

(Prepared by H. P. Sheets, manager of the Price and Service Bureau, National Retail Hardware Association)

1. Necessity of good buying
   - Service of customers. Good buying is a part of service
   - Competition
   - Cost of doing business
   - Profits
   - Buying vs. selling, if goods are not rightly bought they cannot be rightly sold

2. Buying essentials
   - Knowledge of local needs
     - Trade territory
     - Population
     - City—town—country
     - Men—women—children
     - Buying capacity
     - Class of goods
     - Trade conditions
     - Present demand
     - Can demand be increased?
   - Knowledge of competition
     - Local
     - Distant

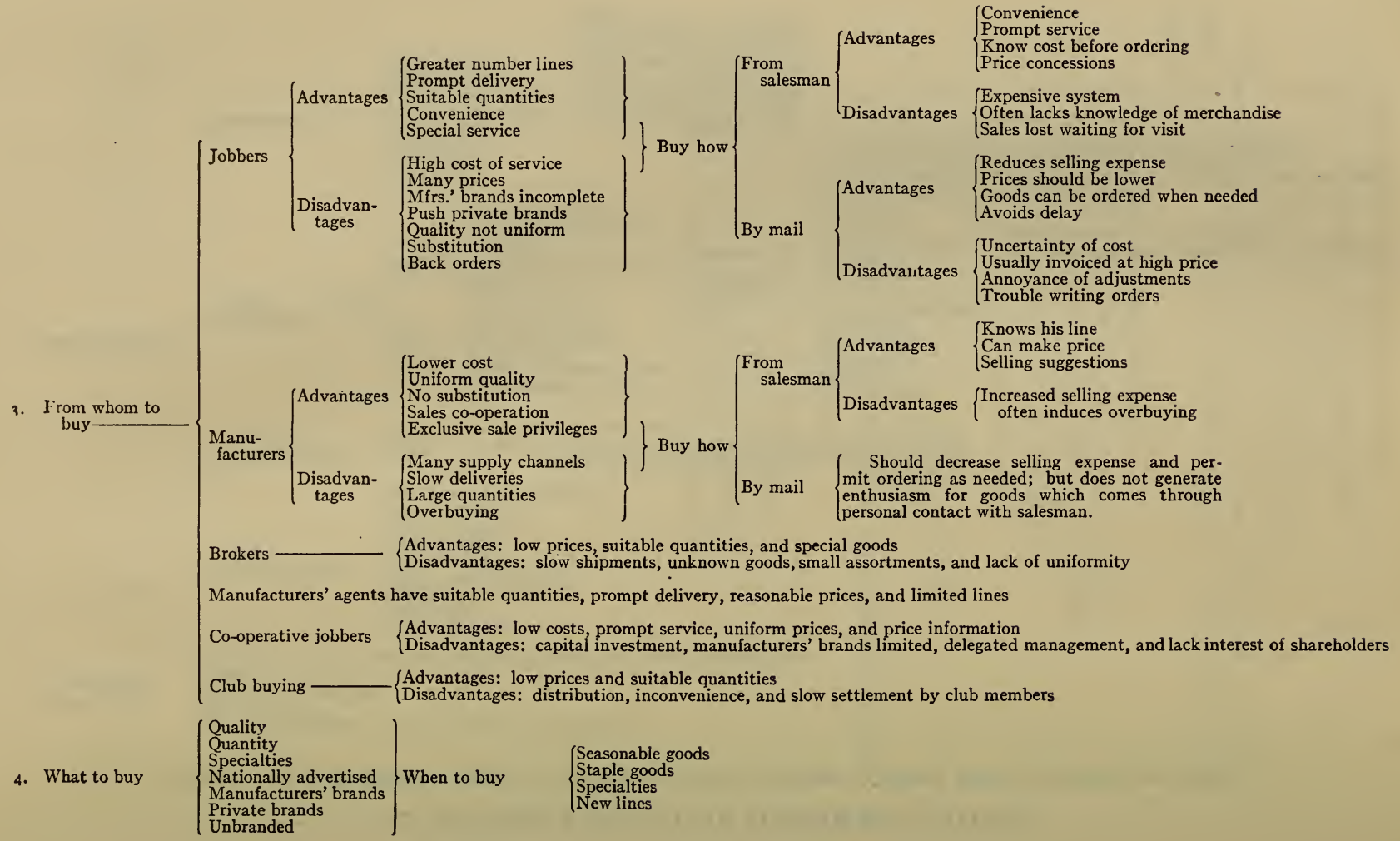
     As selling prices are regulated by competition, merchant must buy at figures which will protect his profits. "Goods well bought are half sold."
   - Knowledge of prices
     - Current retail
       - Local hardware stores
       - Local department stores
       - Chain stores
       - Near-by city stores
       - Mail order houses

       Sources of information:
       - Local papers
       - Circulars
       - Windows
       - Store visits
       - City papers
       - Catalogues and fliers
     - Buying markets
       - Manufacturers
       - Jobbers
       - Manufacturers' agents
       - Brokers
       - Co-operative jobbers
       - Other supply channels

       Sources of information:
       - Trade papers
       - Salesmen
       - Quotation sheets
       - Catalogues
       - Circulars

       The buyer who does not know his buying field and current prices is at a big disadvantage.
       - Letters of inquiry, when quantity justifies
       - Going to market, e.g., jobbers often have "close-out" lines at bargain prices which come to the attention of house visitors only
       - Price and service bureau of National Hardware Association
   - Buying records
     - Invoicing
     - Stock-keeping
     - Quantities
     - Turn-overs
     - Good vs. slow sellers
     - Prices—quotations
     - Pricing goods
     - Special orders

       In every community there is some demand for goods which dealer cannot afford to stock. Sources of supply from which prompt service and competitive prices may be had should be carefully listed.


3. From whom to buy
Jobbers
Advantages
Greater number lines
Prompt delivery
Suitable quantities
Convenience
Special service
Disadvantages
High cost of service
Many prices
Mfrs.' brands incomplete
Push private brands
Quality not uniform
Substitution
Back orders
Buy how
From salesman
Advantages
Convenience
Prompt service
Know cost before ordering
Price concessions
Disadvantages
Expensive system
Often lacks knowledge of merchandise
Sales lost waiting for visit
By mail
Advantages
Reduces selling expense
Prices should be lower
Goods can be ordered when needed
Avoids delay
Disadvantages
Uncertainty of cost
Usually invoiced at high price
Annoyance of adjustments
Trouble writing orders
Manufacturers
Advantages
Lower cost
Uniform quality
No substitution
Sales co-operation
Exclusive sale privileges
Disadvantages
Many supply channels
Slow deliveries
Large quantities
Overbuying
Buy how
From salesman
Advantages
Knows his line
Can make price
Selling suggestions
Disadvantages
Increased selling expense often induces overbuying
By mail
Should decrease selling expense and permit ordering as needed; but does not generate enthusiasm for goods which comes through personal contact with salesman.
Brokers
Advantages: low prices, suitable quantities, and special goods
Disadvantages: slow shipments, unknown goods, small assortments, and lack of uniformity
Manufacturers' agents have suitable quantities, prompt delivery, reasonable prices, and limited lines
Co-operative jobbers
Advantages: low costs, prompt service, uniform prices, and price information
Disadvantages: capital investment, manufacturers' brands limited, delegated management, and lack interest of shareholders
Club buying
Advantages: low prices and suitable quantities
Disadvantages: distribution, inconvenience, and slow settlement by club members
4. What to buy
Quality
Quantity
Specialties
Nationally advertised
Manufacturers' brands
Private brands
Unbranded
When to buy
Seasonable goods
Staple goods
Specialties
New lines

5. Aids to good buying

- **Concentrate purchases** — Make business attractive to seller by giving volume. Gross quantity should entitle buyer to concessions even though certain items are purchased in small quantities.
- **Pay promptly** — Jobbers and some manufacturers insist sliding scale of prices necessary because of irregular methods of payment. Prompt payment establishes prestige with sellers and puts dealer in line for any special favors which may be passed around.
- **Discount bills** — Dealer's only profit is often found in his discounts, 2%-10-30 equals 36% annually; a saving of 28% to 30% should bank loan be necessary. Special arrangements should be made with bank to this end.
- **Keeping confidence** — Many a merchant has lost attractive concessions because of his failure to keep prices confidential. It pays to be discreet.
- **Reduce selling expense**
  - **Unnecessary service** — Jobber is giving, and perhaps many retailers are expecting, unnecessary service. Dealer can reduce expense by co-operating with jobber to eliminate much of this.
  - **Mail orders** — Order by mail when possible to avoid unnecessary visits of salesmen—and insist on getting advantage of the saving.
  - **Standard quantities** — Order standard quantities whenever feasible to avoid unnecessary handling expense.
  - **Write plainly** — Write orders plainly, clearly specifying wants, so there will be no misunderstanding or confusion on part of seller.
  - **Understanding with seller** — Have definite understanding with seller that mail orders shall have best prices; that transactions are upon a basis of mutual confidence and fair dealing, and that any evidence of an attempt to take advantage of this relationship will result in transfer of business.

Prepared and issued by
National Retail Hardware Association
Argos, Indiana

36. MEASURING AIDS: TESTING IN CONNECTION WITH PURCHASING[1]

[This selection should be read not to understand the work of the National Bureau of Standards but to get an appreciation of what is possible in the way of testing materials, and to see an agency which makes for ever greater standardization. It is not easy to overestimate the importance of "setting standards."]

Any purchasing agent can have for the asking, as one might say, the benefit of the tests and try-outs made by the world's largest single purchaser of equipment and supplies. Probably there is not a purchasing agent who lacks such facilities but has sighed now and then for a testing laboratory of his own wherein to make practical and scientific demonstrations of the quality of this commodity or that before contracting for a year's supply.

The testing of materials was a newly-created governmental function which was assigned to the Bureau of Standards by Congress when the institution was established in 1901. Naturally, the first duty of the Bureau is to make tests of materials for the benefit of the various governmental purchasing agents who may call upon it for advice, but the Bureau also conducts each year thousands of tests for purchasing agents and other interests outside the government service. Merely a nominal fee is charged in each instance for private tests, but the purchasing agent who is loath to go to any expense whatever on this score can, by keeping in touch with Bureau activities, garner no end of information that will aid him in his buying. Uncle Sam buys pretty nearly every commodity under the sun, and thus, sooner or later, the government is likely to make on its own hook a scientific try-out of everything on the average purchasing agent's shopping list.

The policy whereby the National Bureau of Standards continually takes stock of the best the market affords works to the advantage now and then of the average purchasing agent in the commercial field, even though he may not have asked for advice or assistance—even if he is ignorant of the very existence of the Bureau of Standards. To see how this works out let us take a concrete case. The United States government purchases each year a total of not less than one million incandescent electric lamps. In order to ascertain exactly what the Federal purchasing agents were getting for their money there was fitted up at the National Bureau of Standards a "light test

[1] Adapted by permission from Waldon Fawcett, "The National Bureau of Standards," in the *Purchasing Agent*, I (1915), 101–5.

room" in which every year more than 5,000 bulbs are burned out in "life tests" that show conclusively whether lamps, as they come from the factory, are actually giving the proper amount of light, that they do not require too much current to yield this illumination, and that they have in each instance the requisite life of practically 1,000 hours. And how does this benefit the purchasing agent who does not get his electric lamps under a government contract? Simply by keying up the manufacturers to higher standards of excellence.

Latterly the whole policy of the National Bureau of Standards has been to seek to induce manufacturers and producers to give quality because quality pays, and not merely through fear of a rejection of the goods.

It may interest purchasing agents in general to know that the director of the Standards Bureau is not at all a believer in the practice of purchasing "by sample." He declares that it is "a makeshift of the poorest sort" and should be resorted to only "in the absence of definite and reliable specifications in terms of measurable properties."

Standards of quality are not, however, the only exactions that loom large before the purchasing agent. Standards of performance are in their way just as important, and consequently we find the Bureau of Standards performing missionary work of distinct value to the whole purchasing fraternity in its effort to have the performance of every instrument, device, or machine guaranteed in terms which are correct and susceptible of measurement. The Bureau experts take the ground that any specification is useless unless it be not only based upon correct mechanical and scientific principles but also embodies a statement of the precise method to be used in ascertaining whether the specifications or guarantees have been complied with. The Bureau officials feel that they will have accomplished something well worth while if they can bring about such understanding, by all parties, of the quantities to be measured and the method to be used that there will be no room for disputes between contractors or manufacturers on the one hand and purchasers on the other.

37. MEASURING AIDS: A SAMPLE SPECIFICATION[1]

GENERAL SPECIFICATIONS FOR SECTIONAL FILE CASES, BOOKCASES, TRAYS, AND CABINETS

Workmanship and material.—All workmanship must be the best known to the trade; all material must be the best of the kind specified.

[1] Taken from one of the pamphlets issued by the General Supply Committee, United States Government.

Lumber.—Lumber must be bright and harmonious in color, thoroughly air-seasoned, properly kiln-dried, and free from knots, shakes, sap, discolorations, or other defects. Quartered white oak must be strictly white oak, no part of any piece to have the medullary ray at a greater angle than 45° to the quartered face, and all pieces in any one article must be well matched in color, figure, and grain. All exterior surfaces on articles specified as quartered oak must show strictly white oak, edges of stiles on face of case to be veneered, and legs of sanitary bases to be built up with interlocking joint to show quartered face on four sides.

Poplar, ash, chestnut, beech, or birch may be used for all interior framing.

Construction.—Framing to be by mortise and tenon or dovetail, as may be most suitable. Mortises must be as deep as possible, tenons full depth, and not less than one-third the thickness of the material.

Dovetail must extend full width of the joint and must be finished flush and show no openings.

Joints must be true and perfect, well glued throughout, and held under pressure until glue has set. Best Irish glue must be used and must not be used after reheating has affected its strength.

All moldings to be worked on solid wood; no moldings, except glass beads, to be nailed on.

All ends to be paneled.

All base sections must have glue blocks at angle of rail and leg, to run full width of rail and of ample thickness, to be of hardwood and well glued.

Each section to have frame at top and bottom of interior, with at least three rails in frame, grooved to accept three-ply panel inclosing top and bottom of sections.

Exteriors and partitions to be secured to the frames by dado or dovetail construction, well glued and nailed.

Backs to be three-ply, exterior ply to be beech, birch, or quarter-sawed red gum, except when finished backs are ordered, when exterior ply shall match the wood used in sides of section, finish veneer to be not less than $\frac{1}{16}$ inch thick when laid. Ends to be rabbeted to back, and back to be securely glued and nailed to ends and interior frames with cement-coated nails.

All partitions to be solid, face edge to be lipped to match the rest of the unit; partitions and rails to finish flush on front of section.

FINISH

Preparation.—All surfaces must be smooth, and those to be varnished, except unexposed surfaces, must be made perfectly smooth by scraping and sandpapering. Any article which shows dark spots due to filler sticking to surfaces not properly smoothed may be rejected. The use of putty is prohibited except in nail holes.

Materials.—Stain and filler must not cloud the grain and must leave the flake in quartered oak as clear as possible. Shellac must be white shellac cut in grain alcohol. Varnish must be an approved brand of standard manufacture and free from rosin; samples of varnish to be submitted.

Colors.—Samples of standard oak and mahogany colors and finish may be seen at the office of the General Supply Committee.

Standard finish.—Hardwood exteriors to be stained, thoroughly filled to an even color, the filler thoroughly cleaned up, allowed to set, given one coat of shellac, sandpapered smooth, and three coats of varnish, each allowed to dry hard and be sandpapered smooth before the next coat is applied, the last coat to be rubbed with pumice and oil to a semidead gloss. No gum runs will be allowed.

Interiors of all articles, including drawers and pigeonholes, except surfaces to be lubricated, must have one coat of shellac and one coat of varnish. The front edges of shelves and division pieces under $\frac{1}{4}$ inch thick must match the exterior in color and receive the same finish as exterior. Drawer sides and runs to be lubricated with paraffin oil. Panels must be stained and filled before setting. Interior of doors to be rubbed, same as exterior, after last coat.

Unexposed parts.—Tops, bottoms, backs, and all unexposed parts, except drawer sides and runs, which can be reached after assembling, to have one coat of shellac and one coat of varnish.

Interior of bookcase sections to be stained, and to receive one coat of shellac and one coat of varnish.

Sides, backs, and bottoms of drawers when made of metal to be finished with baked enamel, guaranteed against rust.

Hardware.—Pulls, label holders, rod fronts, handles, etc., are to be solid cast bronze, brush finish, to match hardware on cases in the office of the General Supply Committee.

38. PURCHASE AND STORES UNDER UNSYSTEMATIZED, SYSTEMATIZED, AND SCIENTIFIC MANAGEMENT[1]

[This selection should be read not only to get information concerning purchasing and storing but also to get a flavor of the meaning of the term *scientific* management.]

1. The purchasing of materials, stock, and miscellaneous supplies under *unsystematized* management may be done by one man or by a purchasing department; but more likely this duty is not very well defined and the purchasing is done by a number of persons, especially those needing the material. Little study is put on the standardization of materials, and different kinds of stock for the same use are often bought. This tends to remnants on some kinds, overstock and understock on others. The buying is seldom done on exact specifications, is not always even by written order, nor is there a predetermined maximum and minimum established of each article that should be carried in stock. The head of the business or the buyer may be an exceedingly shrewd trader and may buy very close at times; but he will not always buy the materials best suited to the work, often overbuys or underbuys for lack of definite information, and is frequently tempted by bargain lots that seem cheap but may cost more to use in the shop.

The lack of well-organized purchasing results in work progressing to a certain extent through the shop until it is stopped and occupies space waiting for some material which has been overlooked, or which is not suited for the purpose. A fairly successful publishing house in one of our large cities does its buying by the unsystematized fashion. Last year in making up its statement of profit and loss, the inventory of paper amounted to $20,000. Three-fourths of this paper exists as overruns, or odds and ends of lots which are stored in various printing offices and cannot be used on an average-sized job. They are so scattered they cannot be combined, and the make, color, finish, and size are different in nearly all the lots. When this house realizes what this stock is, it will be forced to write off nearly $15,000 from its books on what it now considers good assets.

The storage of materials and purchasing are very closely related to each other. Loss of time hunting for material is the same, whether

[1] Taken from H. P. Kendall, "Unsystematized, Systematized, and Scientific Management," in *Proceedings of the Tuck School Conference* (1912).

the material is lost in the storeroom or has not been purchased, and a lack of system in one department will undo attempts at system in the others. The effect of badly organized stores is: (1) Loss of time; work which should go through the manufacturing department rapidly is held up at different places waiting for materials of the proper kind or amount, and this is a direct loss. (2) Loss of space; more space is required to hold stores in an unsystematized way, and for lack of standardization more stores will be kept on hand than are required. Space is also lost in the workroom because work in process does not pass promptly through the workrooms if delayed for material. (3) Loss of capital, because more money is tied up in stores which are not systematized and properly regulated, and more money is tied up in the jobs which represent labor and material sidetracked throughout the plant.

2. In a *systematized* plant, materials and supplies are purchased through one man or department, a maximum and minimum generally established, and a decided effort made to purchase the materials best suited to the workrooms. Some analytic methods are used in determining the proper materials, and standardizing is done on the more important kinds. This purchasing department aims to have a stock of everything required, but buys largely what it is asked to. It does not always make purchases on complete specifications, and a lack of complete standardization increases the detail of that department. So far as the clerical system is developed, however, it is generally quite good.

A marked contrast to the storage methods of the unsystematized plant will be seen at once. Here is an adequate room in charge of a storekeeper who issues stores only on requisitions, and is expected to keep his place neat and orderly and deliver his stores on call. A perpetual list is kept in the office and balanced with the stores, and the balance is proved by an actual count of the stores once a year or oftener. Stores are partially classified and standardized to some extent. It is only the most-used stores that are assigned to orders before actually called for. The physical handling of the stores, moving them in and out of the storeroom, is done by the assistants of the storekeeper, and the efficiency of this work and the orderliness of the department depend wholly upon the kind of man in charge. The central office can exercise very little real control in this department.

Not all systematized plants control work from a central planning station by writing the operations for each process before the work is started; therefore materials are not exactly pre-determined and work is still likely to be started before it is discovered that some material is lacking. Neither are the quantities always kept up automatically through the purchasing department by a predetermined maximum and minimum of each kind. Also, it is general practice to have storage space for different departments, some of which are not under control of the office; for instance the miscellaneous supplies used for the power department for repairs, piping and plumbing, electrical maintenance, etc., may be scattered about with little idea of order, while the actual materials for use in manufacture may be in good order.

3. *Scientific management* is not satisfied merely to have plenty of materials on hand when wanted, to roughly standardize the principal items of stock used, and to buy at the market rate, but demands that all materials be carefully studied with reference to: (1) the greatest adaptability to the work; (2) quality and uniformity; (3) price; (4) determination of the proper maximum and minimum that shall be carried, so that the stores department may automatically govern materials and supplies which should always be on hand.

When this has been done, care is taken to make all purchases on detailed specifications. The importance of using materials best suited to the work, and which are uniform in quality and by standardization reduced to the smallest variety, is not sufficiently appreciated by the buyer in even the systematized plant.

For example, a manufacturer of razors using a thin blade could not secure a steel which would always act alike and produce a uniform result with uniform treatment. He employed a steel expert of reputation to assist him. This expert purchased the best razors that different barbers had, analyzed them chemically and microscopically and, as every man who uses a razor might guess, found very great variation even in the same makes. In fact, he satisfied himself that no razor manufacturer, however well systematized his plant was, had ever scientifically determined the best steel, or had purchased it on a formula that would standardize this material. As a result, all these years the buying of a razor had been a lottery.

After many tests this expert secured from various steel manufacturers samples of steel on their formulae and his own, and he

finally developed a formula that would give the best razor steel known and maintain it uniform. As a result of this method of buying, this manufacturer stood alone among the razor producers of the country in ability to produce razor blades of standard quality.

Another illustration of the standardizing of materials. In studying the supplies of a business it was found that there were twelve kinds of wrapping paper regularly used, and an investment of $2,500 was needed to carry a sufficient amount. This was standardized and now the twelve kinds of paper have been reduced to four, with a saving of $1,000 in the stock, 60 per cent in the storage space occupied, and the available worth of this paper for the demands that may be made on it is 20 per cent more than what it was formerly. This illustrates the saving made on but one class of material used in a factory where standardization is being worked out.

Such methods of purchasing compel the purchasing department to be intimately associated with the working of the materials through manufacture, and result in the following: (1) uniform material best adapted to the work saves labor and delay in workrooms; (2) minimum of kinds and sizes necessary to be carried; (3) storage space saved; (4) lower costs through buying in larger lots.

The physical aspects of a storeroom under scientific management do not differ greatly from those in the systematized. A proper means of holding or piling the stores, laid out in an orderly fashion, is provided. To avoid confusion in a varied terminology, mnemonic symbols are used to designate the different kinds of stores. The maximum and minimum mentioned above are determined for each kind, and kept on the ledger sheets in the central planning room. The bookkeeping for the stores is not carried on in the storeroom, the storeroom force simply acting on orders. The location of the materials is also indicated on the ledger sheets, or, as they are known, the balance of stores sheets.

Under scientific management it is not sufficient, when materials are required, to send a requisition to the stores department, but all orders or work which require material have the items looked up and assigned to the specific orders by the balance of stores clerks, and this material when assigned to a given order is not available for another order which may follow. This is done before the materials are required for use, and this method serves as advance warning to the stores clerks if an unexpected demand for a particular material is likely to occur. Quick action is then possible in purchasing more.

The work of moving materials into the stores department and moving them from the stores department to the particular place where they are to be used becomes a function of the planning of the work, and of the routing of the work, and the workman who is to use them should not be delayed or have to give a thought to the materials which he needs for his next job. They are moved in the right condition for his use to the point where he can use them to the best advantage. The time which the workman spends looking for or waiting for his materials can be better spent in effective work.

39. THE INTERDEPENDENCE OF PURCHASING WITH OTHER FUNCTIONS[1]

[This selection is particularly helpful in showing the interdependence of business problems. Do "lines of authority" and "lines of communication" need to coincide in a business organization?]

Let us consider separately, but briefly, and mainly in outline and in a suggestive way, the relation of the purchasing department to the other departments and functions of the business.

Management.—Most authorities on factory organization make the purchasing department responsible and accountable directly to the general manager. Certainly it is important that the purchasing department report direct and keep the management fully informed as to conditions affecting costs and the operation of the plant. The connection of the purchasing department to the management should be so close and so intimate that this department can be the first to respond to any changes of plans or policy affecting rate of production or changes in types or classes of the product of the factory. Failure here is almost fatal, and yet how often do we find the manufacturing departments putting forth their best efforts to increase output by means of an increased force or longer working hours while, as yet, little or no effort has been made to prepare for the increased demand on the supply of raw material?

Or again, how often do we find the normal supply of material continues to come in after men have been laid off or hours shortened in an effort to reduce the rate of production in keeping with a falling-off in demand for finished product?

[1] Adapted by permission from A. C. Ward, "The Purchasing Department of a Manufacturing Organization," in *The Engineering Magazine*, XLVI (1913), 349–54.

Accounting and cost.—It is important that the work of the purchasing department should be so planned that invoices may be checked as to prices, quality, and quantity of the goods covered, and then passed *promptly* to the accounting department. All essential information regarding discounts, rebates, transportation, and claims of various kinds should also be promptly and clearly furnished in connection with the invoices. The purchasing department, on the other hand, should be kept fully informed as to any disputes or misunderstandings arising in settlements of accounts, or anything of that nature which might affect the relationship or attitude of those furnishing material and supplies.

Sales and order departments.—It is advisable that the purchasing department keep in close touch with new business and with the general trend of inquiries and prospects, both as to the effect on the volume of business and as to the relative demand for different sizes and types of product. To provide this information, some provision should be made for the purchasing department to have a summary or classified survey of sales orders as they are entered, together with a statement of inquiries and prospects so far as they are special in quantity or types. The method of accomplishing this will depend upon the nature of the business and the peculiarities of the local organization.

Receiving and stores department.—The relation between purchasing on the one hand and storing material and delivering it where and when needed, on the other, is so intimate that it is usually thought advisable that stores be directly under the authority and management of the purchasing department, or, at least, that the purchasing department audit all requisitions and have final jurisdiction as to quantities, etc., carried.

The storekeeper should have complete copies of all purchase orders, except that portion of the order pertaining to prices, terms, etc., and should be kept fully informed as to prospective deliveries, delays, cancellations, changes, etc.

There should be the closest co-operation and the best possible understanding between the purchasing department and the storekeepers as to quantities to be carried, policies of retrenchment or advancement, disposition of obsolete and surplus stock, etc. Storekeepers should also be taught to study and classify the needs and demands for the different classes of material carried, so as to combine requisitions and anticipate needs and thus facilitate placing all purchase orders to the best possible advantage.

Designing and engineering.—Perhaps there is no phase of this subject presenting greater possibilities or providing more food for thought or more opportunities for profitable action than this of the relation of those who *specify* and those who *provide* the material entering into the complete product of the organization. The knowledge, experience, and facilities of the purchasing department as to quality, cost, availability, etc., of different materials should always be at the command of the designing and engineering departments, and should be freely used in designing new product or re-designing old lines. The relations of these departments should be so cordial and intimate that the purchasing department will be freely consulted on all such matters and be assured a voice in the final approval of all such designs and changes. Certainly, the specifications, when issued, should leave as wide a margin or latitude as possible to the discretion and judgment of the purchasing department in regard to the particular grade, quality, form, and source of supply of the material used. To this end, the purchasing department should possess a practical knowledge of the equipment, processes, methods, and requirements of the manufacturing departments, and be guided by this as well as a knowledge of the comparative availability, prices, etc., of material offered by different sources of supply.

Production order and manufacturing.—The purchasing department, either directly or through the stores department, should be the first notified of new work being contemplated or actually placed in the shop. Such notification should include or be accompanied by a complete list of material and parts required. So far as possible, time should be given to procure all needed material and supplies before work is actually begun.

The manufacturing officials and departments interested should be kept fully advised by the purchasing department in regard to any failure or delays in getting necessary material or parts, or any other conditions arising within the jurisdiction of the purchasing department which may in any way affect the progress of work in these departments.

I believe it is desirable that the purchasing department be in position to follow the progress of the material through the various stages and operations in the factory and to know at first hand of its suitableness for the conditions and work required. This knowledge is one of the essential requisites to successful and satisfactory purchasing of material for a manufacturing institution.

40. A POSSIBLE PURCHASE DEPARTMENT ORGANIZATION[1]

The organization of the purchasing department will depend not only on the amount of yearly purchases but on the nature of the business as well. One man can purchase a tremendous quantity if the purchases be made in large lots, or if the variety of articles purchased be small. One man can purchase more from the dollar and cents standpoint if he deals, say, in coal only than the man who buys for a chain of five- and ten-cent stores. Not only can he buy more, but he will need less assistance in following up the orders after they are placed to see that they are shipped in time and come up to specifications. Detail takes time, and where there is detail there are required more hands to take care of it properly.

The buyer for a contracting company which maintains practically no storage facilities will require a purchasing department differing from that required by a corporation with a warehouse and which uses the same variety of articles year in and year out, since the latter can judge its needs sufficiently in advance to stock them. The detail involved in one case may be the same as in the other, but the contractor usually wants deliveries promptly, and rush orders require more attention than routine orders.

Some businesses have very marked rush and dull seasons, the buying for the entire year being done during one season. Obviously such a concern could not maintain an elaborate purchasing department during the dull season even though it were highly efficient during the busy period. In fact, any department of any business should be so designed that it can be expanded or contracted in conformity with the volume of business to be transacted.

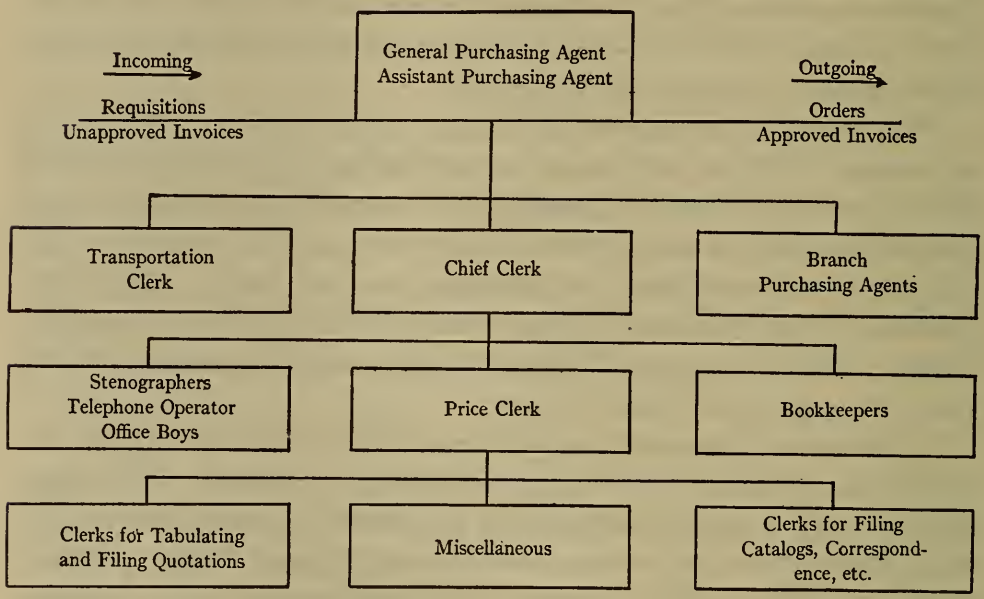
Some businesses are so highly specialized that no one purchasing department can be organized to do all of the buying. Each purchase may require the skill and judgment of an expert. Knowledge of the salability of an article may be paramount. It may be impossible to impart to a central purchasing agent, on paper, full information. In such cases each department of the business should do its own buying and there will be no need of a central purchasing department.

From the foregoing it is not hard to understand that it is impossible to lay out a purchasing department that will fit any business unless the nature and size of that business be known in advance, any more

[1] Adapted by permission from C. S. Rindsfoos, *Purchasing*, pp. 80–84. (McGraw-Hill Book Company, 1915.)

than one could design a light and power plant for a municipality without first knowing the size and nature of the municipality. However, it is possible to set down the lines of good standard practice and this may serve as the suggestive basis on which to work in any specific case.

It will be the duty of the general purchasing agent to take care of the general management and supervision of his department. A large part of his time will be taken in the negotiation of large orders or contracts, particularly when they reach the closing stages. He will formulate the policies which his department is to pursue, seeing that



it accords with the general policy of the corporation which he represents. He will represent his department in consultations with the executive heads of the other departments, such as the accounting department, auditing department, construction department, contract department, etc. All differences which arise between his department and another will be for his consideration. He will often indicate to his chief clerk the sellers from whom he wishes bids on a given requisition, and he will keep a general oversight of the progress of orders of special importance, even after they are placed. In short, he will be the responsible head, mainspring and inspiration of his department.

The assistant purchasing agent will assist the general purchasing agent in whatever way he may be instructed. It is usual for the

assistant purchasing agent to take as much of the detail off the shoulders of the general agent as practicable. He will usually examine all correspondence intended for his superior, bringing to his attention only such as is most important. In fact he will ordinarily handle all the routine matters so that his superior will have a large part of his time free for consultation.

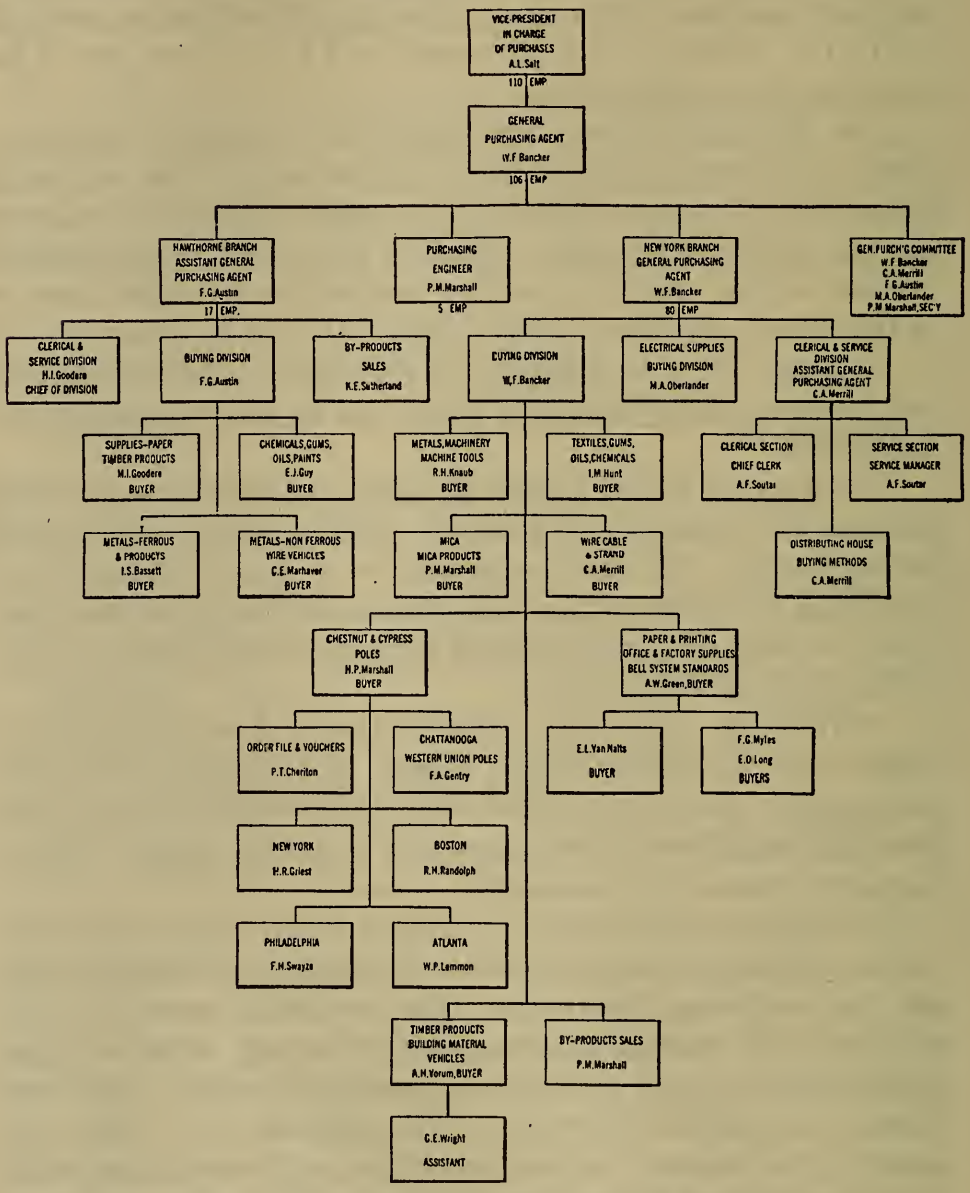
The chief clerk will report to the general or assistant purchasing agent, and be responsible for all the clerical work of the purchasing department. In many cases he will determine who shall bid and send out the requests for tenders. Much of the routine correspondence relating to bids, prices, etc., will be handled by him either direct or in the general purchasing agent's name. He will be responsible for the discipline of the department. In the absence of both the general and assistant purchasing agents he will act as the executive of the department.

The duties of the price clerk will consist primarily in maintaining accurate and up-to-date price records, checking invoices for material delivered to see that same are correct as to price (although this is often done in the accounting department), examining tabulated bids to see that the prices are in line with the market, and in general supervising the filing of all papers.

It will be the duty of the transportation clerk to keep posted on freight rates, to examine freight charges, and to prepare claims for overcharges. He will also watch orders after they are placed to see that they are shipped promptly and not delayed in transit. This is frequently a very important service.

The inspection and testing of materials either during manufacture or after delivery will usually be under the engineering department, and not the purchasing department. The purchasing agent, however, will furnish the engineering department with a copy of the order and specifications in order that the engineering department may know what it is entitled to demand of the manufacturer or seller. If, however, the business does not include an engineering department, the inspecting and testing should be under the purchasing department, in which case the inspector should report to the general or assistant purchasing agent direct.

41. ORGANIZATION OF GENERAL PURCHASING DEPARTMENT OF WESTERN ELECTRIC COMPANY



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CHAPTER V

THE ADMINISTRATION OF FINANCE

Purposes of this chapter:

1. To see the outstanding tasks confronting the administrator in his relationship to finance.

2. To understand the institutions, devices, and policies which he uses in meeting these tasks.

3. To visualize the organization which may be set up to administer these financial relationships.

The financial problems of the modern manager are both numerous and difficult to solve. Our minds are prepared to accept the first part of this statement quite readily. Our whole economic organization is on a pecuniary basis; business is a pecuniarily organized method of gratifying wants; it is quite natural, accordingly, that financial problems should arise at every turn of the manager's path.

But business has been on this pecuniary basis a long time and we might well suppose that standard solutions had long since been secured for most financial problems. This is far from the case. A striking bit of evidence that much remains to be done in the financial aspects of management is shown by the following list of questions in business finance which (1920) require investigation according to the finance committee of the Boston Chamber of Commerce. The student should read this list carefully as a means of surveying, through the eyes of business men, the unsettled problems in this field.

1. Business barometers: what they show and what they fail to show.

2. The relation of successful industrial finance to the business cycle. How can financial methods be put on a more scientific basis?

3. Can "financial standards" be established for operating the different types of industries? (This would involve a comparative analytic study of the various "ratios" to be derived from the financial statements, income and expense accounts, etc., over a period of years.)

4. Is there a "standard" investment for the different types of manufacturing business? What size conduces to the greatest financial success, and what is the minimum safe investment?

5. What are the best methods of financing a small business? In what ways should the banks help such concerns?

6. How shall working capital be provided? What should be its relation to fixed capital in different types of industry?

7. The seasonal element in different types of industries. What can be done to level the peaks and fill the valleys?

8. The possibilities of budget-making for business concerns.

9. Financial co-operation between business concerns.

10. When shall a business borrow from the bank and when through note brokers and commercial-paper houses?

11. What improvements can be suggested in the methods of arriving at the amount of the line of credit extended by banks to the different types of industries?

12. What proportion of the earnings shall be distributed and what proportion put back into the business?

13. Is there "over-competition" in the marketing of securities? If so, to what extent has it affected the cost of capital, and what measures can be taken to improve the situation?

14. The turnover of stock (or "working assets") in its relation to the financing and financial success of different types of manufacturing concerns.

15. How shall the periods of depression be financed? What rules should be followed (*a*) by the banks, (*b*) by the business concerns?

16. The abuses of commercial credit.

17. To what extent can improved financial methods decrease business failures?

18. The theory and practice of the cash discount.

19. The uses and limitations of the trade acceptance in different types of industry.

20. The pros and cons of "no par value" stock.

21. The proper relations between bonds and stock in industrial corporations.

22. Rules for financial success in the foreign trade game.

23. Profit-sharing from the point of view of industrial finance. Does it increase profits?

24. Will wider distribution of ownership of business concerns lead in the long run to greater profits? To what extent is it desirable that employees and the public have a "vested right" in industry?

25. What relations should exist between the credit and the sales department in various types of industry?

26. The financial aspects and results of advertising.

27. Financial aspects of purchasing—particularly the financing of excess purchases of raw material at a low price through temporary borrowing. How far is it safe to go?

28. Better financial co-ordination between the sales and production departments.

29. Possible financial advantages of more direct distribution of the product to consumers in certain types of industry.

30. What are the greatest financial *wastes* in certain types of industry?

31. The effects of "blue sky" legislation on legitimate industrial finance.

32. How can our bankruptcy law and procedure be improved?

33. What changes in the federal tax laws will lead to greater business prosperity?

34. What effect would greater publicity of accounts have on business profits?

This list was not introduced into our discussion with any idea that it could wisely be used as the basis of our study. Its usefulness for our purpose is in the light it sheds on the attitude of practical business men toward financial problems. These men realize clearly enough that finanical problems are *numerous, unsettled, and much interwoven* with problems of marketing, production, social control, and all the other outstanding relationships of the manager.

In our general survey of financial management we shall seek an understanding of the following matters: (1) the financial institutions which the manager can utilize; (2) the technical devices, such as corporate securities, accounting systems, and commercial credit instruments, which he finds convenient; and (3) the financial policies in terms of which he actually does utilize these institutions and devices. These items make up the subject-matter of the chapter, which will be presented in five sections.

A. What it Means to Start and to Finance a Business, pages 388–97.

B. The Manager's Relationship to the Financial Organization of Society, pages 398–429.

C. Financial Policies and Occasionally Used Devices, pages 429–69.

D. Financial Policies and Frequently Used Devices, pages 469–512.

E. Organization for Financial Administration, pages 512–22.

A. What It Means to Start and to Finance a Business

From the veriest beginnings to the final disappearance of a business there is a continuous procession of financial problems. Of course there is. Business is engaged in, under our economic organization, with the hope of securing profits. Profits, the prime test of the success of an enterprise, are computed in financial terms as are also all costs and all incomes. Technology, labor, markets, risks, and all the other outstanding relationships of the manager are, consciously or unconsciously, translated by him into financial terms.

Perhaps this is only another way of saying that financial issues are so pervasive in business administration that it is exceedingly difficult to find the beginning, end, or middle of the matter when one tries to arrange it for discussion purposes. Any arrangement is pretty certain to be arbitrary. One method of opening our discussion is that of making a general survey of what it means to start a business; what the chief financial matters are which must be cared for at the outset; and what leading methods there are of providing finances thereafter. We shall make such a general survey in this present section which we are calling "What It Means to Start and Finance a Business." In later sections we shall try to go a little more deeply into the subject.

PROBLEMS

1. Notice the list of costs mentioned in Selection 1 as being connected with starting a business. Are they present when an individual proprietorship is formed? All of them? When a corporation is formed? Always? Will the funds of the business (whatever this may mean) need to be large enough to cover such items?
2. If I look over the situation and decide to open a grocery in a certain district, have I engaged in the promoter's function?
3. What classes of persons are likely to serve as promoters in our modern society?
4. Who would do the promoter's work in a socialist society? Would there be any need of such work?
5. What is the promoter's social function? Does he play any part in the guidance of economic activity?
6. Compare as methods of financing a business, (*a*) borrowings, (*b*) gradual growth from reinvestment of earnings. What are the advantages and disadvantages of each method?
7. What should be the attitude of the financial manager toward investments in side-lines? Why?

8. "A manager who 'doesn't owe a dollar in the world' is not regarded as conducting his business upon approved lines." Explain.
9. What are the chief forms of fixed capital?
10. What factors must be considered in figuring the fixed capital requirements?
11. "The chief forms of working capital are: (*a*) cash; (*b*) accounts and bills receivable; (*c*) finished stock; (*d*) raw stock and supplies; (*e*) securities of other companies held for investment, not for purposes of control." Are there deductions which should be made?
12. "The volume of working capital depends upon the nature of the business, and it should be determined with reference to: (*a*) volume of business; (*b*) distribution of purchases throughout the year; (*c*) the credit terms upon which purchases are made; (*d*) the credit terms upon which sales are made; (*e*) the period of production during which capital is tied up in work in process." Show the bearing of each item. Should other items be included?
13. "A dealer may have too much capital in his business for his own good, just as he may have too little." What is the reason for this statement? Which would you regard as the better credit risk, the man with too much capital or the man with too little capital?
14. How can you tell whether a business man has too much or too little capital? What are the disadvantages of having too little capital?
15. Work back over the preceding questions, considering in the case of each whether it is applicable to (*a*) an individual proprietorship, or (*b*) a partnership, or (*c*) a corporation.

1. STEPS INVOLVED IN STARTING A BUSINESS[1]

[The following selection has specific reference to the steps involved in starting a (corporate) gas plant business. It should be read, however, with the mind searching for the application of each point to other types of business. Most of the matters mentioned apply to the case of an individual proprietorship or a partnership as truly as they do to a corporation. And they are by no means peculiar to the gas business.]

The cost of a gas plant and of acquiring its business may be subdivided as follows:

1. Preliminary development, which includes:
   a) Investigation of the project
   b) Assembling of parties who may be willing to participate

[1] Adapted by permission from C. W. Gerstenberg, *Materials of Corporation Finance*, pp. 455–56. (Prentice-Hall, 1915.)

c) Preliminary engineering and legal advice on the proposition
d) Canvass of territory to ascertain if sufficient business can be obtained
e) Estimate of cost of plant and probable income
f) Incorporation of the company; and
g) Securing the franchise

2. Real estate
3. Labor, materials, and sub-contracts
4. General contractor's profit
5. Engineering
6. Expense of company organization during construction
7. Interest during construction
8. Taxes and insurance during construction
9. Stores, supplies, and working capital
10. Acquiring or establishing the business, which includes:
    a) Expenses of canvassing for business
    b) Advertising
    c) Setting meters free of charge
    d) Interest on cost of plant in excess of income until business becomes self-supporting; and
    e) Taxes and insurance during that time
11. Legal expenses
12. Financing, including banker's commission, discount on bonds, and promoter's profits

Many of these items are overlooked by those who have had no experience in the actual establishment of such a business, and that, no doubt, is the reason why the cost of such a plant and establishing such a business almost always largely exceeds the anticipated outlay.

2. PROMOTION AND THE PROMOTER[1]

The function of a promoter.—A promoter is a man who organizes a new business and sets it going. The business need not necessarily take the form of a corporation. It may be handled as a partnership or a joint-stock company.

"Discovery" of a proposition.—A promoter in handling an enterprise has three separate tasks before him. First, he must "discover" his proposition; second, he must "assemble" it; third, he must "finance" it.

The discovery of a proposition does not mean simply to find it, but includes a thorough investigation into all the surrounding con-

[1] Adapted by permission from W. H. Lough, *Corporation Finance*, pp. 194–98, 207–10. (Alexander Hamilton Institute, 1916.)

ditions, and the solution in advance of all the difficult problems that are likely to arise in its development. Let us suppose, for instance, that a new invention which looks good on the surface is brought to the attention of a promoter. If he understands his business he will first of all examine critically every point that points toward the invention's success or failure. He will find out whether it is patented and just what features the patent covers. Next, he will consider whether other devices are in use which perhaps accomplish the same purpose as well or nearly as well as the invention. After making sure that the invention is what it purports to be, he will consider the possible markets for the article.

Next, the promoter takes up the cost of manufacturing. He finds out whether new and specially constructed machinery is necessary in manufacturing the invention, and whether any especial skill on the part of laborers is required. He considers the amount of experiment that will be necessary in order to perfect the invention and in addition figures a large amount of extra cost for unforeseen contingencies.

These are only a few of the factors that the promoter would investigate before taking any further action. Their number is sufficient to indicate, however, that any promoter who has a reputation to make or preserve cannot afford to jump hastily at whatever proposition is presented to him. The process of discovery may take a long time, perhaps months or even years.

"Assembling" a proposition.—By assembling a proposition is meant the process of getting temporary control into the hands of the promoter. If he is dealing with an invention, he assembles the proposition by getting an option on the invention or by making an agreement with the inventor on a royalty basis. In the case of a consolidation of plants or railroads into a new corporation, assembling is frequently much more complicated and difficult. In such a case the promoter may have to get options or arrange the terms of purchase with every plant and perhaps with all the different classes of security-holders involved.

Financing a proposition.—Now we come to the most difficult part of the promoter's work, his financing of the new corporation. No hard and fast rules can be laid down to cover the promoter's procedure.

We may classify the men who spend a considerable amount of their time and energy in promotion into four groups. Let it be clearly

understood, however, that this classification does not pretend to be complete.

First come the professional promoters, the men who really do make it their main, and almost their sole, business to hunt for enterprises that promise profits and to finance those enterprises. This type is common in fiction, but rare in real life. So far as the writer recalls, he has met only one man who could be put in this class, a tall, lank, fervent individual with a persuasive air.

The second class consists of lawyers and bankers in small communities. Such men have exceptional opportunities to inform themselves as to local conditions; they frequently take hold of some local enterprise, such as a steam or street railway, secure the assistance of experts for investigation, and carry through the proposition to success. Still more frequently, however, so far as the writer has observed, such men underestimate the difficulties of the problem; they take it up with enthusiasm but are forced either to drop it or to call in men of wider experience.

The men to whom they generally turn constitute the third class of promoters, namely the larger bankers and brokers. The amount of promotion work performed by such men is limited and they usually confine their active participation—except for advice—to the financing of such enterprises as they take up.

The fourth class—and this is a recent important development—consists of engineering firms engaged in construction work of various kinds. Certain large engineering concerns have established a wide reputation for success in operating street railroads, water works, electric lighting plants, and so on. These firms naturally have built up a large and well-equipped staff of experts in those fields. As the staff is expensive, it becomes a pressing problem to keep them profitably employed all the time. In the effort to solve this problem such firms have drifted into the custom of taking up new enterprises of merit and performing the work of promotion themselves.

3. METHODS OF FINANCING AN ENTERPRISE[1]

The usual method of financing an enterprise is that of interesting moneyed men. Other methods are, however, followed on occasion. The simplest of these is found when the owner or promoter has the

[1] Adapted by permission from Francis Cooper, *Financing an Enterprise*, pp. 16–18, 21–27. (The Ronald Press Company, 1909.) Later published in three volumes under the author's real name, H. R. Conyngton.

means, and himself invests the money needed for his enterprise. Much difficulty is avoided by the adoption of this plan, but unfortunately it is not generally practicable.

Next to this method comes the good old plan of gradual development—the actual building up of the enterprise from the financial materials at hand, these materials being at first perhaps the accumulated means of the parties, then returns from the operations of the enterprise itself, or funds secured from some other occupation or business while the enterprise is in course of building, or a combination of any two or all of these.

This method is absolutely inapplicable to the development of those very numerous enterprises where large purchases, investments, or installations are an essential preliminary. There are other cases in which it is entirely inadvisable because of the slowness of the process, as in the development of a patent with but a limited period to run, the building up of a business where competition may only be overcome or prevented by quick and brilliant success, and the many other cases where time is the "essence" of the undertaking.

Where this development plan is applicable and advisable, it is ideal. It avoids the risks, the mistakes, the expensive experiments, and the premature development more or less characteristic of all "financed" enterprises in which the managers are inexperienced or the lines of business new.

It is the step-by-step method. A man developing an enterprise in this way is, at the start, working on a small scale, his expenditures are necessarily limited and his progress is unavoidably slow. His experiments are, as a matter of necessity, cautious, carefully watched, small in cost, and quick in results, be they good or bad. If good, the particular line of effort is pushed; if bad, abandoned without serious loss of either time or money. In either case the facts of the particular experiment are determined in the course, perhaps, of a few weeks and at the cost of a few dollars, while in a more pretentious venture the same result would be demonstrated no more satisfactorily at a cost of hundreds or even thousands of dollars and months of time.

During this period the proprietor is going through a course of business training from which he secures a grasp of the business, and an understanding and control of its every feature that nothing else could give so thoroughly and satisfactorily. As a result of this he frequently attains a degree of success which would hardly be possible under any other system of development.

A modification of the personal development method sometimes followed with excellent results, is the *gradual upbuilding* of a new enterprise as a side line. That is, the owner, already occupied, continues in the business or employment in which he is engaged and from which he derives at least a support, and gives the new venture such time, attention, and money as it needs or as he can spare from his main work.

The advantages of this "side line" financing, when it is practicable, are obvious. In a new enterprise of limited capital there is almost invariably a period of harassing uncertainty, sometimes quite prolonged, when the income is exceeded by the outgo and the future of the whole venture trembles in the balance. If then the owner is meanwhile profitably employed and able to supply additional funds as they are needed, the danger of failure is largely removed and the very knowledge that the "base of supplies" is not in danger is in itself an element of strength and of success.

On the other hand, the development of a new enterprise by this method is slow, the business itself is almost certain to suffer and perhaps fail from lack of attention, and, finally, it may be said that in practice most of these side line attempts are failures.

Another method of financing enterprises sometimes employed is to borrow the money required. This is only possible where the personal standing or the collateral security of the borrower is such in itself as to justify the loan, as it is seldom that the enterprise itself would be considered security for the money needed for its development.

If the enterprise itself is good, the owner or the party in charge a good manager, and a loan can be made on fair terms, the plan has advantages, mainly in the fact that the control and ownership of the new undertaking are left in the hands of the original parties. It is true that a bonus must often be paid to secure the money; that interest must be paid on the loan, and that the borrowed money must, sooner or later, be returned. If the enterprise is successful, however, the indebtedness and interest payments are easily carried and paid off in due time, and the whole amount given for the use of the money should be small compared with the profits of the enterprise that must have been given to secure the needed money as an investment.

If, on the other hand, an enterprise ends in failure, the loaning plan is disastrous—far more so than if the money were secured as an investment in the enterprise. For this reason many people, well able to borrow, prefer to get part or all of the necessary money as an invest-

ment in the enterprise rather than as a loan. In this case they divide up the risk. They do not look for failure, but they recognize its possibility in any undertaking, no matter how good. Therefore they prefer to diminish their own interest in the enterprise and in the profits to be made, rather than to take chances of a total and perhaps disastrous loss in case of failure.

Also while the interest on the money borrowed is, in the case of a good enterprise negligible, there are other dangers connected with the method. Loans and interest payments have a tendency to become due at inconvenient times, or if left to run after they become due, may be called unexpectedly. Then if not met, they may be used to the serious embarrassment of the enterprise.

As a matter of fact loans are not infrequently made to parties having promising enterprises, with the definite hope or expectation that they will not be able to pay the amount when due. In such case the parties making the loan promptly foreclose and buy in the enterprise at a tithe of its real value.

Another method of financing, frequently practiced, is that of taking in moneyed partners. It must be borne in mind that a partner has all the rights in the business that the original owner has himself. He can interfere in the management of the enterprise, run it into debt, if he sees fit, or make trouble in the many other ways possible under the partnership arrangement. All this is of no importance if the partner is known to be the right kind of a man, who will shoulder his part of any burdens to be borne, and who can be depended upon to co-operate when needed and to do nothing when not needed. If, however, there is any doubt as to the character or disposition of the prospective partner, this close alliance should be avoided—preferably, and as is commonly done, by the use of the corporate form.

Another point to be considered when a financing partner is taken into an enterprise, is the fact that should the enterprise not reach the point of profit paying before its funds are exhausted—a contingency that frequently occurs—the conditions are not favorable for securing further money. In a corporation, stock may be reserved for just such emergencies, or a special issue of preferred stock or perhaps bonds can be arranged. In a partnership, on the contrary, there is usually no reserve of any kind that can be offered for additional money. If more money is needed each partner should, of course, contribute pro rata of his interest for the purpose, but in practice it not uncommonly happens that the "financing" partner refuses to do this.

In any such case, the working partner must do the best he can. He may be able to borrow, or he may have to make very material sacrifices of his own interests to obtain the needed funds. In such case, if the enterprise is successful, he will probably be able to recoup himself. It is, however, far better that the possible need of more funds should be anticipated and provided for in advance by some provision of the partnership agreement. It is better still to avoid the contingency by the incorporation of the undertaking.

The usual, and, speaking generally, the best plan of financing, is by the sale of stock in the incorporated enterprise. It offers advantages both for the owner of the enterprise and the investor found in no other system of business organization.

See also chap. viii. The Form of the Business Unit.

4. WORKING CAPITAL AND FIXED CAPITAL[1]

Working capital consists of that portion of the net assets which is not tied up in any fixed or permanent form. The chief forms of working capital are: (1) cash; (2) accounts and bills receivable; (3) finished stock; (4) raw stock and supplies; (5) securities of other companies held for investment, not for purposes of control.

Working capital consists essentially of quick assets, such as are convertible into cash within a reasonable time in the ordinary course of business. Such quick assets, like fixed assets, are subject to great shrinkage in value in event of failure, and should always exceed by safe margin the short-time liabilities. The working capital is only the difference between the quick assets and the short time-liabilities. Some companies operate on a very narrow margin of working capital; a few, in fact, possess none at all. But many of the larger producing corporations retain as much as half their entire capital in this form.

The volume of working capital depends upon the nature of the business, and it should be determined with reference to: (1) volume of the business; (2) distribution of purchases throughout the year; (3) the credit terms upon which purchases are made; (4) the credit terms upon which sales are made; (5) the period of production during which capital is tied up in work in process.

Most of these factors speak for themselves. A large business obviously requires more working capital than a small one. The

[1] Adapted by permission from W. H. Walker, *Corporation Finance*, pp. 209–10. (Alexander Hamilton Institute, 1917.)

regularity of purchases is an important factor. In the grape juice business, for instance, the entire stock of grape juice for the year must be purchased in September and October. The bridge-builder may at one time have no stock on hand and at another have large sums tied up in materials, pending the completion of a large contract. It is plain, therefore, that lines of business which purchase seasonally or irregularly, or sell likewise, require a large working capital because of the heavy stocks which they carry at times.

The credit terms of both purchase and sale have great influence upon working capital. If the company pays for its materials, say thirty days net, and sells upon sixty days' time, it will require a much larger working capital than a company which buys on sixty days' time and sells on thirty. The writer knows of several companies which have no working capital of their own but deal entirely upon the trade credit which is extended to them, by buying on long terms and selling on short.

During the period of production, or pending resale of goods, capital is tied up by work in process. Some companies turn their capital several times each year and require only a small percentage of profit on each transaction, while others—for instance, builders of ships and office buildings—turn it less frequently, and consequently require a larger percentage of profit on each sale and a correspondingly larger working capital.

In this connection, the extreme importance of perpetual inventory, careful stockkeeping, avoidance of wasteful methods, and the maintenance of minimum stocks need to be emphasized. It is better for the company to carry a somewhat smaller stock and a larger cash balance, under normal conditions, than to carry heavy stocks. The large bank balance improves the credit of the company, while the large stock often increases manufacturing cost and frequently encourages wasteful and careless methods. The larger the stock, other things being equal, the slower will be the turnover and the greater the working capital required.

[From the foregoing statement of the chief forms of working capital, the student can readily arrive at a statement of the chief forms of fixed capital.]

See also p. 520. Financial Standards.

B. The Manager's Relationship to the Financial Organization of Society

We found that our study of the administration of market problems was facilitated by an introductory survey of the market forces and market structures in terms of which and through which the market manager worked out his policies. (See pp. 250–308.) Precisely the same situation confronts us in our study of the administration of finance. The financial manager, in working out his problems, makes use of a great range of institutions and devices which have been developing through several centuries. These institutions are so interrelated that we have come to call the whole complex "the financial organization of society."

This financial organization of society very largely conditions the administration of finances. Upon the one hand, it is made up of institutions which the manager uses in manipulating such technical devices as stocks, bonds, and commercial paper (see pp. 434–88), in carrying out his financial policies. Upon the other hand, this financial organization has come to provide the standard orthodox ways of carrying out policies and thus it operates as a sort of social control system which largely dictates what policies the manager shall attempt.

Clearly enough, we shall not understand either the technical devices or the policies of financial administration unless we have an appreciation of this institutional background. We begin with Selection 5 which gives a general view of the manager's use of our financial organization. Selections 6 to 9 show us some investment credit institutions, some commercial credit institutions and some information gathering institutions of which the manager makes *immediate* and direct use. Selection 10 deals with a secondary range of institutions which serve the manager *indirectly* by serving the institutions with which he comes into direct contact.

PROBLEMS

1. "The financial organization of society." Just what does this mean to you?
2. "The manager's use of the financial organization of society." Just what does this mean to you?
3. What financial institutions are available for the financial manager who wishes to issue corporate securities?
4. What is the practical necessity for underwriting?

5. Wherein is underwriting advantageous to the corporation concerned? to the buyer of securities? to the underwriter? to the consumer of ordinary commodities?
6. Why did the development of investment banking institutions wait upon the growth of the corporate form of industry? Did the absence of investment banking houses in an earlier period handicap private enterprise?
7. "The primary function of the bond house is to obtain capital for the creation of new enterprises or the enlargement of old." Just how does it "obtain" this capital?
8. "The investment banker does not require a large capital tied up in the plant like a manufacturing organization." Why not?
9. What other financial institutions does the investment banker use when he engages in underwriting on a large scale?
10. Write a summary of the social benefits of the investment banking business.
11. "The commercial bank acts as an intermediary between lenders and borrowers. It collects funds from certain people and lends them to others." Do you agree?
12. Do you see any ways in which the ordinary commercial bank facilitates getting "fixed capital"?
13. How does the work of commercial-paper houses differ from that of pure brokerage? How does it differ from pure banking?
14. What is meant by referring to the banker as a responsible agent in the guidance of economic activity? As an agent in the apportionment of our productive resources among the various enterprises of the community? Wherein do these questions concern the financial manager of an ordinary business?
15. What is meant by blue sky laws? Wherein do they affect the manager in his relationship to finance?
16. "Certain concerns carry on together the work of engineering and operating concerns and also the work of financing houses." Who? Why?
17. How do you account for the fact that concerns make money by securing and selling financial information? Do they fill a real need?
18. Make a list of the services that are rendered by trust companies (*a*) to individuals (*b*) to corporations. Why is the rapid growth of trust companies a matter of the last half-century?
19. Precisely how does the trust company aid in the marketing of securities?
20. Should the manager of a corporation employ a trust company to act as fiscal agent or should he care for the problems concerned himself and "save the fees"?
21. Just how do life insurance companies aid the financial managers of other businesses?

22. Just how do savings banks aid the financial managers of other businesses?
23. What types of investment should you expect a savings bank to make? Should you expect to find state laws regulating this matter?
24. "The Stock Exchange is a market for capital." Do you agree? If you disagree, what is the function of the stock exchange?
25. Show how the stock market is of service to each of the financial institutions with which it is connected in the chart on page 403.
26. Sometimes the "money market" is "tight" and interest rates rise and it is not easy to get funds for corporate expansion. Be sure you know what this means.
27. This section of our work sketches a rather impressive financial structure. Is it used only by large concerns? How do small corporations get their capital?
28. "As a matter of fact, persons contribute to the capital of corporations of which they have never heard; of which they would disapprove if they had heard of them." How can this be true?
29. "The manager's decisions on financial problems are largely prescribed for him by the financial organization of society. His range of choice is a narrow one." Is it? Is it narrower than it was before there had emerged so many financial institutions?
30. Make as long a list as you can of financial institutions which are not discussed in this section.
31. Consult question 14 on page 250. Wherein does an awareness of his social function make a financial manager a more competent business man? What is his social function?

5. A GENERAL VIEW OF THE MANAGER'S USE OF OUR FINANCIAL ORGANIZATION[1]

The great number of financial instruments, agencies, and institutions that are utilized in connection with the borrowing operations of producing, manufacturing, and mercantile businesses is indicated in the diagrams on the accompanying pages.

The diagrams, however, require a few words of explanation and qualification. In general, the purpose is to show the financial institutions and agencies that are employed in the assembling of the capital required by modern business enterprise. It is of note, first, that the financial structure involved in the raising of fixed capital for individual firms and partnerships, as shown on the first diagram, is relatively simple, since it is largely contributed by the owner, or

[1] Adapted by permission from H. G. Moulton, *The Financial Organization of Society*, pp. 132–38. (The University of Chicago Press, 1921.)

owners, of the business. The greater complexity of the second diagram, moreover, is an indication that the development of the very intricate and extensive financial organization of the present day is largely attributable to the enormous growth of the corporate form of business organization.

With reference to the corporation diagram, particularly, the arrows pointing downward from fixed capital indicate the movement of the securities that are issued by corporations through the financial institutions that assist in marketing them to the ultimate purchasers, who in the last analysis furnish the funds to the corporation. In some cases the securities do not find lodgment with individual investors but are purchased by financial institutions, as is indicated by the arrows which point to savings banks, insurance companies, etc. In these cases, however, the funds are still furnished by individual savers, namely, the shareholders, depositors, etc. These financial institutions thus serve as intermediaries in the process of rendering individual savings available for the uses of corporate industry.

The stock market has been placed at one side of the diagram in order to indicate that it is not a direct intermediary in the marketing of securities. It is rather a great central market place which is made use of by nearly all of the various types of financial institutions in connection with their operations, as well as by the ultimate investors in securities. The lines connecting the stock exchange with the different institutions are designed to indicate in a general way the interrelations that exist.

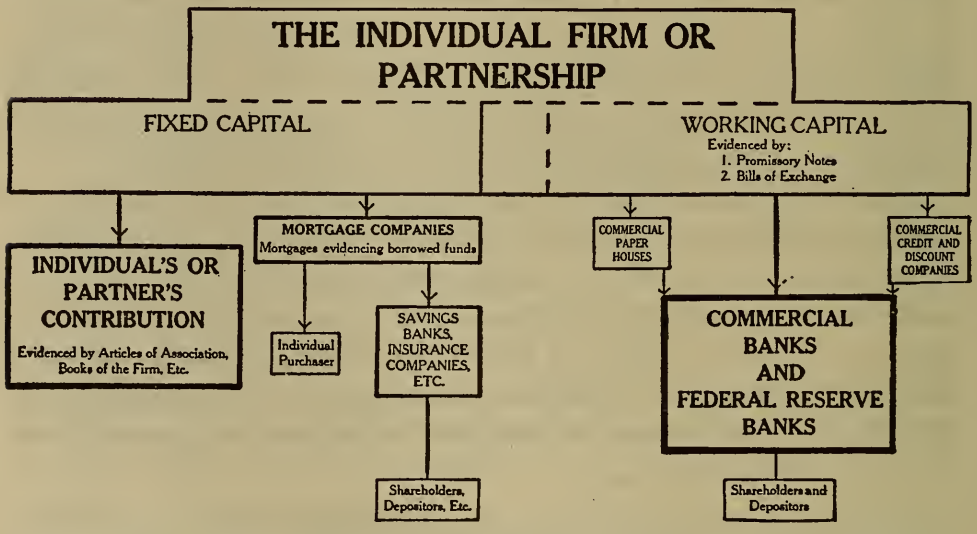
Finally, it will be seen that the commercial banks are directly concerned with the raising of working capital, and indirectly associated with investment banking institutions in the raising of fixed capital. Note the transverse line connecting commercial and investment banks. A line might also be drawn from the commercial banks to the fixed capital side of the corporation; for to a considerable extent they purchase securities directly and make loans to corporations for fixed capital purposes.

To safeguard against misconception it is necessary to state that the diagrams could not be made to reveal all the phases of the modern financial structure without complicating them to the point of obscurity. It will be well, therefore, to point out here certain things which they do not indicate.

First, although a line is drawn from the corporation direct to the purchaser of securities, the corporation chart fails to convey an

adequate idea of the vast amount of capital that is raised without the assistance of financial intermediaries. A very great number of our corporations have raised their capital by direct subscription; indeed, I think it may safely be said that a large percentage of our present-day corporations secured their start by converting individual firms or partnerships into corporations and issuing shares of stock to the owners. There are many "close" corporations—those which have never raised any funds from general subscription. Among some of the more important of such corporations are: most of the New

I. INSTITUTIONS UTILIZED IN FINANCING NON-CORPORATE ENTERPRISE



England cotton mills; several of the larger chemical companies; the Du Pont Powder Company; many of the great department stores in all the large cities of the country; the large corporations in the aluminum, brass, zinc, asbestos, and sulphur industries; and the great majority of financial institutions.

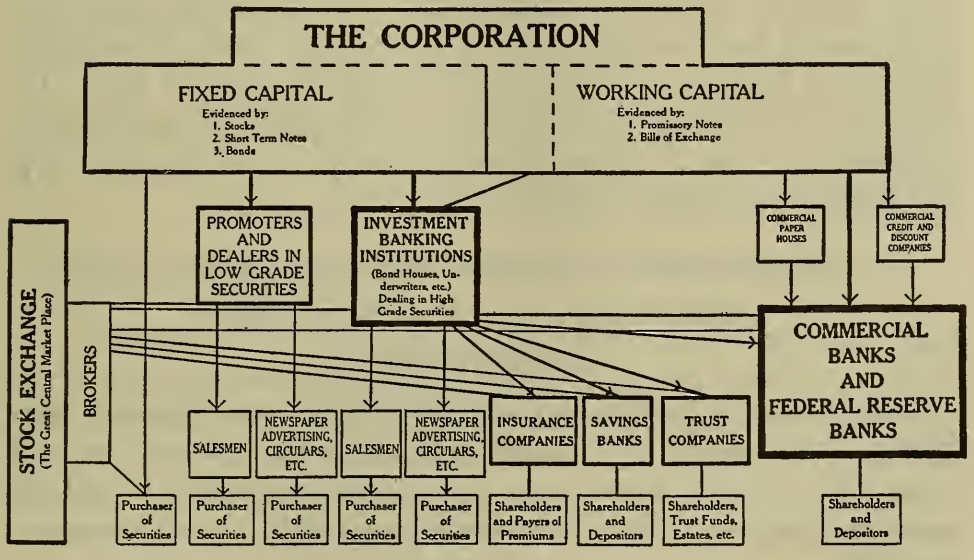
Second, the charts do not reveal the raising of capital by the common process of creating a surplus through setting aside a portion of the earnings for an expansion of the business. A tremendous amount of capital is thus raised, especially by corporations. It will be noted that this method merely involves a decision of the directors of the corporation with reference to the disposition of earnings.

Third, the charts reveal only those credit operations which involve the borrowing of funds, as distinguished from actual goods. Working capital in part takes the form of materials bought on credit.

A retailer, for instance, may do most of his borrowing by buying goods from wholesalers on time. But since the wholesalers who sell these goods on credit to the retailer, usually borrow from the commercial banks during the interval while awaiting payment, it all comes to much the same thing in the end—working capital is largely borrowed from the commercial banks.

The corporation chart does indicate, however, that a portion of the working capital is usually derived from the sale of securities. Indeed, if a business is to have a good credit standing with its bank,

II. INSTITUTIONS UTILIZED IN FINANCING CORPORATE ENTERPRISE



it must, in fact, provide a considerable part of its working capital by stock subscriptions.

Fourth, one might conclude from the corporation diagram that savings banks are associated only with the problem of raising fixed capital. As a matter of fact, many savings-bank loans are also made for working capital purposes.

Fifth, the position of the trust company in the financial structure of society is not adequately revealed. As the chart stands, the trust company is related only to the raising of fixed capital and is placed in a parallel position with savings banks and insurance companies. In fact the trust company performs so wide a variety of functions that it is impossible in the present diagram to indicate its relationship to the entire financial structure. The commercial banking

department of the trust company would go with the commercial banks, the bond department with the bond houses, the savings department with the savings banks, the insurance department with the insurance companies. But, in addition, the trust company performs a great variety of services for the holders of corporate securities in connection with the safekeeping of valuables, the holding of mortgages in trust, the transfer of ownership of stocks and bonds, the financial reorganization of companies, etc.

Finally, the diagrams tend to give a false impression of specialization by financial institutions. The truth is that more and more there is being conducted under one roof and by a single administrative organization a great variety of financial activities. Just as the trust company has many departments, the commercial bank nowadays usually has associated with it savings and bond departments, and, in the last two or three years, trust departments as well. The designations given on the diagram must, therefore, be considered as representing types of financial functions rather than (in every case) distinct and specialized financial institutions.

6. INVESTMENT CREDIT INSTITUTIONS USED DIRECTLY BY THE MANAGER

A. THE UNDERWRITERS[1]

One means of floating an issue of securities is to dispose of them through the agency of banking and brokerage houses. In such cases the financial houses may not merely undertake to sell the securities, but may make themselves responsible for the success of the sale.

Advantages of underwriting to the corporation.—There are several reasons why banking and brokerage houses may properly carry on this business of financial underwriting and why the business is usually profitable both to themselves and to the corporation which issues the underwritten securities. In the first place, the bankers are presumably experts in the valuation of securities. Their judgment as to the price which should be set on a new security or as to the terms of exchange, if the new security results from a conversion of an old security, is a valuable, authoritative judgment. In the second place, the bankers are also experts in selling securities and each house involved in the underwriting usually has an established clientèle to

[1] Adapted by permission from W. H. Lough, *Corporation Finance*, pp. 294–304. (Alexander Hamilton Institute, 1916.)

whom it may readily dispose of almost any securities that it recommends. The corporation, on the other hand, has no facilities whatever for selling stocks and bonds; its activities are in the field of transportation, or industry, or trade, not in finance.

Two further reasons are even more potent in inducing corporation managers to have new security issues underwritten. First, even though the corporation can obtain expert financial advice and is reasonably sure to make a success ultimately of the sale of any securities it puts out, yet the time that will elapse before the sale is completed and the money received is always uncertain. Now the corporation ordinarily would not be trying to sell new securities if it did not need money at once or in the near future. It is disastrous to the success of many industrial or commercial operations to hold them in abeyance until the tedious process of selling a large block of bonds or stocks is completed; yet it is dangerous to go ahead so long as the sale is incomplete. The second reason is that the credit of a corporation is seriously affected by any apparent inability to market its securities. One failure—or even a success that is too hard-won—would hamper the corporation greatly both in getting loans and in making future sales of stock.

Advantage to the buyers of securities.—There are telling advantages to the buyers of securities also in having them underwritten. Reputable banking houses never sell securities until after they have been satisfied by a searching investigation that the securities are all that they are represented to be.

Another advantage to the buyer is that he may be sure that the whole security issue has been sold by the corporation. A half-sold issue is a sign of weakness and a hindrance to the completion of the corporation's plans so serious as to reduce the value usually of the portion that has been sold.

A third advantage to the buyer is that any reputable banking house will watch closely any security that it has underwritten, and will come to the assistance of the security-holders in case the corporation later gets into difficulties.

When is underwriting advisable?—It must not be inferred that every new stock or bond issue ought to be underwritten. Small issues, say $500,000 or less, can usually be sold to a comparatively small number of investors by direct solicitation on the part of the corporation. Then again, well-established, successful corporations frequently sell new stock or bond issues to their stockholders at

bargain prices. Ordinarily there is no risk in such a sale and consequently no necessity for underwriting.

Why underwriting syndicates are formed.—It would naturally be expected that each of the large financial houses engaged in the underwriting business would handle on its own responsibility whatever business comes its way, and that rivalry would prevent their co-operating to any considerable extent. The fact is, however, that these houses have long since learned that it is inadvisable for any one of them, no matter how powerful, to guarantee the success of a large security issue. It is true that the banker's judgment and experience should enable him to avoid heavy risks; yet a certain amount of risk is inevitable. It is not considered conservative banking, therefore, for any one house or even any two or three houses to underwrite a large issue.

Another reason for co-operation among bankers is that each house desires to offer a variety of securities to its clientèle. If it specializes too much or offers only a few securities, it cannot expect to attract and hold regular customers.

A third reason for co-operation is in order that a broad geographical distribution may be obtained and the sale of the security issue be made correspondingly easy.

Five types of syndicates.—Originally the normal arrangement was to have the syndicate as a whole guarantee the price of the issue and let the corporation attend to the selling. This is underwriting in the original sense of the word; it is a species of insurance. Under such a plan the syndicate would have two sources of profit: first, a commission on the portion sold to the public, or a fixed bonus; and, second, the difference between the wholesale price to them and the retail price at which they would ultimately dispose of the bonds.

A second type, also rather unusual, is a syndicate formed to take an "underwriter's option." Under this plan the syndicate takes the block of bonds or stock at a fixed price, payable only as resold. As fast as the syndicate disposes of the bonds it turns over the proceeds to the corporation, after deducting whatever it receives above the fixed price. The corporation pays somewhat less for this service than for other kinds of underwriting, because the syndicate takes no risk; on the other hand, as the corporation cannot be certain when it will get its money, the type is not much favored by conservative corporation managers.

The third type of syndicate comes into existence when a large banking house has bought for itself a big security issue and wishes to distribute the risk. In such a case the original underwriter frequently calls upon other banking houses and upon individuals to take portions of the issue at prices low enough to be attractive.

The fourth type of syndicate acts as a unit in making a contract for the purchase of an issue and pools the sale of the stock or bonds. The chief difference between the third and fourth types lies simply in the fact that the syndicate members deal directly with the corporation, not with a banking house. They thus secure for themselves all the profits of the underwriters. Such a syndicate is always managed by some one house or individual having complete authority.

The pooling arrangement above described, although it secures centralized and efficient management, is apt to prove unsatisfactory in that it does not bring into play the whole selling machinery of the various syndicate members. For this reason it has become more and more customary of late years to distribute the security issue among the members of the syndicate. This is the fifth type of an underwriting syndicate. Strictly speaking, of course, the distribution of securities is not an underwriting in any sense, but a sale. It is a sale at a special price, however, made under certain restrictions and designed to serve exactly the same purpose as true underwriting; the term therefore is freely applied to it in the Street.

B. INVESTMENT BANKING AND BOND HOUSES

I[1]

That part of the public which does not buy bonds has little idea of the importance and value to the community of the bond business. It is not necessary to resort to many figures. In round numbers, $1,500,000,000 of American bonds are marketed every year and almost all of them pass through the hands of American bond houses. Even those issues of which the ultimate nominal market is the New York Stock Exchange are first offered and sponsored by dealers in bonds. In volume and number the transactions on the exchange are only a mere fraction of those in direct merchandising. Of this $1,500,000,000 of bonds one-third is absorbed by insurance companies, savings banks, trust companies and other banks (in approximately equal

[1] Adapted by permission from Lawrence Chamberlain, *The Principles of Bond Investment*, pp. 513–15. (Copyrighted by Henry Holt and Company, 1911.)

amounts) and the remaining two-thirds by corporations (for reserve, etc.) and by private investors in this country and abroad.

The leading banking houses were not always primarily bond houses. Two generations ago financial business was transacted by "bankers and brokers." Bond selling was an incident to the general banking, exchange, and brokerage routine. It was all done "over the counter." There was comparatively little implied responsibility on the part of the vendor. In the age of Commodore Vanderbilt, the elder Gould, Fisk, and Drew the "caveat emptor" principle of exchange was accepted and the devil took many beside the hindmost. But now the speculative business in New York, so far as it is reputable and consequential, is done by "members of the New York Stock Exchange" and the investment business is done by "bankers, dealers in investment bonds."

The primary function of the bond house is to obtain capital for the creation of new enterprises or the enlargement of old. So far as concerns these houses in their proper capacity the capital obtained is in the form of loans. The houses purchase the loans outright for their own account and resell to their clients. As in any sort of merchandising, there are few wholesalers and many retailers. The prominent "wholesale" bond dealers, numbering less than a dozen, confine themselves for the most part (as far as American corporation loans are concerned) to the great railroad systems. They have few, if any, traveling representatives. Their sales, in this country, are effected by public subscription, stimulated through extensive advertising, and by distribution to large institutions, such as the insurance companies, and to the smaller bond houses.

"Retail" is not a term properly descriptive of the firms in mind, although it suggests the relative size of the issues handled and the relative volume of business. It misleads if it suggests that the *main* business of such houses is to distribute among small investors issues that originally were investigated and purchased by "wholesale" houses. This is not the case. For the most part each of the American bond houses buys its issues independently, in accordance with its policy regarding investments, or it buys them in "joint account" with other houses having similar policies. These houses are autonomous; their prosperity is built on their ability to find and obtain, on the one hand, funded obligations that merit investment, and on the other, a clientèle that has faith in them and their business judgment and probity.

[This reading should not leave in the student's mind an impression that such houses deal only in bonds. They handle stocks as well.]

II[1]

These banking houses vary a great deal in the range of work they undertake. Some occupy themselves exclusively, or almost exclusively, with municipal finance. Though they may get into other fields, they are likely to do so as brokers, or as a result of trading, or to carry some other kinds of securities to satisfy the needs of their clients. Such houses do not especially concern us. Other houses make the financing of public-service corporations, other than steam railroads, their principal interest. Even in the field of public utilities houses may specialize, as in the securities of gas, or of electric light and power corporations, or in the securities of street railway corporations.

While speaking of houses chiefly interested in the financing of public service corporations, we should especially mention certain organizations which carry on together the work of engineering and operating concerns and financing houses. They both operate and supply the funds for the corporations they are interested in. Sometimes they originally did the engineering work for the construction of the corporations. Though such organizations are not numerous, they are important.

Other banking houses concern themselves especially with financing the steam railroads. Only two or three have the necessary capital and financial connections to handle the largest issues of railroad securities. Railroads, however, often have smaller issues, as for the construction of branch lines or for the purchase of equipment, within the financial ability of ten or a dozen other houses, and commonly these other houses get the financing of such issues. Many houses which do not act directly as bankers for railroads, or seldom do so, still make railroad financing their principal interest by participating in underwriting transactions and acting as distributors of the securities.

A good many banking houses have refused to go outside of these fields. There is no reason why a banking house, recognizing the liability of industrial corporations to greater fluctuations in earnings, and in other ways the greater business risks involved, should not undertake the financing of industrial enterprises, and many do.

[1] Adapted by permission from W. H. Lyon, *Corporation Finance*, II, 39–48. (Houghton Mifflin Company, 1916.)

The total number of banking houses of this kind in the United States is not great. Of about 4,000 offices, at the time of writing, in some way dealing in securities, practically all are brokerage offices of one kind or another. At the time of writing, the membership of the Investment Bankers' Association comprises 340 main offices and 176 branch offices of these houses. Practically the entire organized business of financing the capital account of our corporations centers in these houses. The total number of branch offices is undoubtedly much greater. The branch offices listed as members have, most of them, considerable autonomy in managing their affairs.

People are likely to assume from the magnitude of the transactions undertaken that the business must require the banking house to have a large capital. But the business does not require a large capital tied up in plant like a manufacturing organization. The investment banker is engaged in dealing in credit and requires capital only as an assistance in commanding credit. When the banker supplies the corporation with capital, he receives the corporation's securities at the same time. How much of the capital the banking house must advance itself and how much it can borrow on the transaction depend on the nature of the securities, the position, senior or junior, that they occupy in the corporation's plan of capitalization, and, especially, whether they are of a kind to command a relatively quick and close market. Depending on these conditions the banker can borrow from 50 to 90 per cent of the money necessary to complete the transaction of purchasing the securities from the corporation. Though the loan will rarely be so small, in actual practice, as 50 per cent, the lender produces the same effect by insisting on mixed collateral and by accepting only a percentage of slow and wide market securities as collateral for a loan.

A reader entirely unfamiliar with financial transactions may wonder where the investment banker borrows the money. He borrows at any national bank, state bank, or trust company ready to undertake the business.

7. COMMERCIAL CREDIT INSTITUTIONS USED DIRECTLY BY THE MANAGER

A. THE COMMERCIAL BANK[1]

Commercial banks perform a great variety of services, some of them being in the nature of incidental conveniences to individuals

[1] Adapted by permission from H. G. Moulton, *The Financial Organization of Society*, pp. 361–75. (The University of Chicago Press, 1921.)

and businesses, and others of fundamental importance from the standpoint of the general economic system.

First, commercial banks serve as places of security for the keeping of funds that are temporarily not needed by their owners. Having well-equipped vaults, and being managed (with rare exceptions) by men of integrity, the risk of loss to the owner from fire, theft, or other contingencies is very greatly minimized.

Second, commercial banks serve as money changers. In accommodating each individual customer with the kinds and denominations of money desired, they supply the community as a whole with the forms of currency best adapted to its commercial needs.

Third, through the system of checks, or deposit currency, the commercial banks make possible the use of a form of currency which is a particularly convenient means of payment.

Fourth, the use of checks greatly reduces the risks of monetary transactions. Unless indorsed in blank, checks are good only in the hands of the person to whose order they are drawn; and accordingly the risks from possible loss or theft are virtually negligible.

Fifth, the check system greatly facilitates the keeping of accounts by individuals. Indeed, the banker may virtually take over the individual's bookkeeping; for if a person deposits with his bank all the money he receives in a year and makes all his payments by check, he always has an accurate record of his financial status.

Sixth, the commercial banks perform important services for individuals in transmitting money from one part of the country to another. Upon receipt of the necessary funds, the bank draws a draft upon a correspondent bank in the city where the payment is to be made, asking it to pay the designated party a specified amount of money. Settlements between the two banks may be made in various ways.

Seventh, bankers act as collection agents for their customers, for promissory notes, drafts, coupons, etc. At or before maturity, the individual turns his credit instrument or claim over to the bank for collection. Upon receiving the funds, through its messenger service or by way of correspondent banks, the bank credits the individual's account with the amount received. If the obligations are not paid, the individual is notified and the bank officials are in a position to serve as witnesses in proof that the claim has been duly presented.

These various services are only the simpler ones performed by the commercial banks. Their functions in connection with the issue

of bank notes and the creation of bank credit or deposit currency are the functions which constitute the distinguishing characteristics of commercial banking; they are what give it its paramount importance in the general economic organization of the modern world.

In the making of bank loans there are two main problems. First, there must be assurance that the borrowers are all in sound financial position—that the loans will surely be safe. Second, the maturities of loans must be arranged so as to facilitate meeting the varying demands for cash at different times and at different seasons.

The ordinary commercial bank has the option of loaning funds (extending credit) in the following ways: (1) on single-name promissory notes of individuals and corporations; (2) on two-name paper—indorsed notes and accepted drafts (trade acceptances); (3) on the security of real estate mortgages; (4) on promissory notes secured by other notes as collateral; (5) on promissory notes secured by stocks and bonds; (6) on drafts secured by bills of lading; (7) on promissory notes and drafts secured by warehouse receipts; (8) by investments in stocks, bonds, short-term notes, mortgages, etc.

Loans may also be classified according to whether they are time loans (thirty, sixty, ninety days, or more) or demand loans. Demand loans are of two types: (1) the so-called "call" loans, where the loan is of indefinite duration but terminable at a moment's notice at the option of either the bank or borrower; these are found only in New York City, and are used in connection with stock-market speculation; (2) demand loans, where it is understood that the bank will allow the loan to run indefinitely, in the absence of any untoward development which might imperil its ultimate safety. Such a loan is in effect ordinarily terminable only at the option of the borrower.

Another classification of bank loans—one which runs in terms of the use to which the funds borrowed are to be devoted—is that of *commercial* and *investment loans*. It may be recalled that commercial loans are used for working capital purposes. Whether with producer of raw materials, manufacturer, commission merchant, wholesaler, or retailer, the funds borrowed are employed in meeting pay-roll requirements or in buying the materials or goods required in the operation of the business. They usually run for short periods by virtue of the fact that the time required to carry to fruition the productive process in which they are assisting is ordinarily of relatively short duration.

With investment loans, on the other hand, the funds are devoted to fixed capital purposes; hence such loans are usually of relatively

long duration. In the course of our analysis we shall have occasion to show that the commercial banks furnish funds for fixed capital purposes in various ways—some of them direct, others indirect.

B. NOTE BROKERS, COMMERCIAL PAPER, COMMERCIAL CREDIT AND DISCOUNT COMPANIES

I[1]

The reader may question the economic justification for the existence of the *note broker*. In anticipation of such a question we may say that both the merchant and the banker derive many advantages from the note broker's work. The merchant, even though his local bank has loaned to its full capacity, is able to raise sufficient cash through his notebroker, provided, of course, that the merchant is in good credit standing. Thus, the note broker saves the merchant time, worry, and sometimes embarrassment in obtaining loans. Moreover the merchant, by borrowing through the note broker from banks in different parts of the country, is frequently able to obtain cheaper rates of interest than could be obtained at the home banks. Then, there is some advantage to the merchant in having his paper in many hands. The chief among these is that he becomes known as a good credit risk and will have a wide range of people with money to lend at any time he enters into a large transaction.

The advantages to the bank may be summarized as follows: first, a bank may not be able to loan sufficient funds in its own community, the market is too narrow. Through the note broker, however, the market is extended to absorb all the bank's available funds. Second, the bank is frequently enabled to obtain better interest rates in other parts of the country than home conditions warrant. Third, the bank likes a certain amount of this kind of paper, because there is no obligation to renew it at maturity. A bank which loans to the merchant direct is practically obliged to support him by renewing his note if necessary. On the other hand, the transaction between the broker and the bank is a purely personal one and if the bank refuses to buy the notes or renew them, the merchant knows nothing about it, nor does he care, just so the notes are sold.

The note broker, on his part, wants all the paper put out through him to be good, for if one of his clients defaults, the broker's business

[1] Adapted by permission from R. P. Ettinger and D. E. Golieb, *Credits and Collections*, pp. 50–52. (Prentice-Hall, 1917.

may be seriously injured. Moreover, the broker is well equipped, because of his specialized interests, to pass judgment upon the quality of paper he handles, and he will see to it that the merchant does not over-extend. For these reasons the banker feels secure in accepting paper recommended by the reputable note broker. Indeed, it is seldom that such paper is not honored.

II[1]

The *commercial paper house* is an outgrowth of the note brokerage business that existed in this country in the early years of the nineteenth century. It was not until well after the Civil War, however, that the modern phase of the business developed—the phase, that is, that distinguishes the work of the commercial paper house from pure brokerage; and its greatest growth has come only during the last fifteen or twenty years. The discount companies are of even more recent development. While some of them purchase accounts receivable from many different types of business, these companies owe their most significant development to the automobile industry and the exigencies with which its financing has been confronted.

The commercial paper house acts as a broker in that it brings buyer and seller—that is, lending bank and borrowing customer—together, and receives a commission, regularly one-eighth of 1 per cent of the face value of the note; but it is more than a broker, in that it advances the funds to the borrower and runs the risk of having to hold the paper until maturity.

It should be understood that the commercial paper house never desires to hold the paper to maturity, that it seeks to make its profits out of the commissions which it receives as middleman. And since its chance of large profits lies in obtaining commissions on a very large volume of sales, it will be seen that carrying paper serves to reduce the profits that can be made. In fact, moreover, the cases where the commercial paper house does hold the paper until maturity are relatively few. It should be observed, however, that in all cases the commercial paper house may have to make a temporary advance of funds, during the interval of time between the purchase of the paper from the borrower and the sale of it to a commercial bank.

In recent years there have developed a number of other financial institutions, whose work, like that of the commercial paper houses,

[1] Adapted by permission from H. G. Moulton, *The Financial Organization of Society*, pp. 427–29, 437–38, 444. (The University of Chicago Press, 1921.)

is mainly that of intermediary between borrowing business and lending banks. The institutions in question are variously designated as *discount houses, finance companies, commercial credit companies, commercial acceptance trusts, automobile banks, etc.* It is somewhat difficult to describe the work of these companies, for the reason that the terminology commonly employed in describing their operations is far from uniform—and the principles of operation themselves not highly standardized. Moreover, since certain houses specialize in a particular type of operation, while others engage in more than one form of financial enterprise, it is impossible to state that the financial institutions in question are always conducted on principles thus and so. There are, however, at least two distinct types of financial enterprise which may be differentiated: (1) the purchase of accounts receivable from business concerns—in various lines—which are in need of additional working capital; and (2) the financing of the distribution of automobiles and other products that are commonly sold on the instalment plan.

There are two principal reasons why business concerns on occasion sell or assign accounts receivable: (1) to secure the necessary funds with which to postpone or forestall financial insolvency; and (2) to secure additional working capital with which to expand the volume of business. The first practice is usually regarded as "illegitimate" financing, something to be frowned upon by all conservative and constructive business men. The second—a development of the last ten years—is in a very different category.

The work of the automobile bank is similar to that of the commercial paper houses and discount companies described above.

See also p. 499. Borrowing by Assignment of Accounts Receivable.

8. SOME FINANCIAL INFORMATION GATHERERS

A. THE MERCANTILE AGENCY[1]

The first mercantile agency in the world was established in the city of New York in 1841.

At that period [around 1830–60] it was customary for western and southern traders to visit the eastern wholesale merchants and manufacturers twice a year to make their purchases in person. The terms

[1] Adapted by permission from *Seventy-Five Years of the Mercantile Agency, 1841–1916*, pp. 4–7, 12–20, 80–85. (R. G. Dun and Company, 1916.)

of sale were very simple. The buyer agreed to pay for the goods purchased when he came again. In other words, the prevailing system was six months' credit on all transactions. If a firm had just started in business its buying partner brought with him—on his first visit to the eastern jobbers—letters of recommendation from other merchants in his vicinity, these letters being addressed to the houses from which the merchants were themselves purchasing and to whom they were well known. This was the system that had existed from colonial times, but as the country expanded it showed an increasing tendency to break down. Means of travel and communication were slow and uncertain, and if the letter of introduction failed to convey sufficient information upon which to extend credit with safety, weeks might elapse before it could be supplemented. Meanwhile, of course, the buyer would go elsewhere for his goods, and a valuable account might be lost. Moreover, after once having established trade relations on a credit basis, the jobber had little or no means of judging whether the affairs of his customer were prospering or the reverse. Periods of depression occurred with great frequency in which the eastern sellers lost heavily, owing to the inability of western and southern buyers to meet their obligations. Some of these retail failures were caused by crop shortages, others by money stringency, but the greater proportion were due to the fact that credit had been injudiciously extended to traders who were not entitled to it through lack of reliable information.

The prevailing system of long-term credits, based upon very insufficient information as to the buyer's responsibility in most instances, was one of the chief causes of the great panic of 1837, and contributed especially to the extraordinarily high number of failures that occurred among strictly mercantile houses during that crisis and the periods of severe depression that succeeded it in 1839 and 1840.

Among the more notable failures was that of Arthur Tappan & Co. The failure of A. Tappan & Co. left Lewis, its credit manager, free to engage in some new occupation. His wide experience in appraising the credit responsibility of traders, and the high regard in which his opinions on credits were held by other wholesale merchants, suggested the idea of organizing a credit reporting bureau devoted to collecting and disseminating such information for the benefit of the mercantile community as a whole.

Encouraged by the result of the inquiries he had made among his fellow-merchants as to the favor with which they would regard his

novel enterprise, Lewis Tappan determined to establish what he called "The Mercantile Agency" in the year 1841.

When the new Agency was opened for business, Mr. Tappan's first step was to issue a circular to lawyers and others inviting them to become his correspondents. In this way he hoped to be able to secure, *in advance*, sufficient data regarding the standing of traders to enable merchants to whom they might subsequently apply for credit to determine what amount of credit, if any, could safely be accorded to them. The responses to the preliminary circular proved satisfactory, and The Mercantile Agency rapidly accumulated a valuable mass of reports. These were written in longhand—the invention of the typewriter was still many years in the future—in huge ledgers bound in sheepskin.

Mr. Dun in 1859 became the sole proprietor of The Mercantile Agency. The great event of the year in which the change in ownership took place was the publication of The Mercantile Agency's first *Reference Book*. This was issued February 1, 1859, and was a quaint, old-fashioned affair compared with those issued at present. It was bound in dark brown sheepskin covers (nearly red), extra strong and thick, and with a lock, so that the proprietor of the subscribing firm might retain a key and thus keep its precious contents from the prying eyes of his subordinates or visitors. The volume contained 519 pages, $10\frac{5}{8}$ inches high by $8\frac{3}{4}$ wide, with a maximum of 42 names to a page; an index to cities and towns of two pages, and one of firm names, arranged alphabetically, of 43 pages. Altogether, this first reference book contained 20,268 names.

The publication of the *Reference Book*, then begun, is still continued, the work at present being issued quarterly and containing the names of all traders and manufacturers in the United States and Canada, the January, 1916, book comprising no less than 1,882,226 names altogether.

B. THE NATIONAL ASSOCIATION OF CREDIT MEN[1]

[This selection should be read as a *sample* indicating *associative action* in dealing with financial problems. A manufacturers association, a cost accountants association, and an association of department stores to study financial problems are other samples. Can you cite others?]

[1] Adapted by permission from the pamphlet, *A Builder of Conscience and Commerce*. (Issued by the Association, 1913.)

The work of the Association is directed by annual conventions and carried on by standing committees whose names indicate their duties.

They are: Legislative; Membership; Bankruptcy Law; Adjustment Bureau; Credit Department Methods; Mercantile Agency; Credit Co-operation; Investigation and Prosecution; Fire Insurance; Business Literature; Banking and Currency; Credit Education; Commercial Arbitration; Commercial Ethics.

No practical business man anywhere should willingly withhold his approval of the purposes and objects which gave rise to the National Association of Credit Men.

> The object of this Association shall be the organization of individual credit men and associations of credit men throughout the United States, in one central body for the purpose of rendering more uniform and establishing more firmly the basis upon which credits in every branch of commercial enterprise may be founded, which shall include a demand for the reform of laws unfavorable to honest debtors and creditors, and the enactment of laws beneficial to commerce throughout the several states; the improvement of existing methods for the diffusion of information, the gathering and dissemination of data in relation to the subject of credits; the amendment of business customs, whereby all commercial interests may be benefited and the welfare of all may be advanced; the provision of a fund for the protection of members against injustice and fraud, and such other objects as the members of this Association may determine.

Membership in general is confined to bankers, manufacturers, wholesalers, and jobbers. Today [1913] over 17,000 of the largest concerns located in every state of the United States are united to carry out the purposes of this organization which means that membership therein implies working with a vast body of representative business houses along the same lines and toward the same important ends.

The Association has been instrumental in having enacted laws making more hazardous dishonest practices among both debtors and creditors. In all legislation which it has recommended, the impelling motive has been greater simplicity, uniformity, safety, and stability in the extension of credits. Briefly this legislative effort covers:

1. The bulk sales law, now on the statute books of all states but one. (It regulates the transfer with proper protection to creditors, of stocks of goods in bulk thus safeguarding honest retailers.)

2. A law penalizing the giving of a false written statement in order to secure credit. (In this matter is co-operating with the American Bankers' Association.)

3. Laws to place greater responsibility upon collection agencies.

4. A law to punish the vicious practice of issuing checks without sufficient funds to cover them for the purpose of securing credit.

5. Amendments to the over liberal exemption laws of the several states, to regulate the doing of business under a fictitious name, and to give greater clearness and uniformity to the lien and conditional sales laws of the various states.

6. A law calling for the recording of chattel mortgages with county recorders as well as town clerks.

7. Measures providing for more prompt and business-like administration of our lower courts.

Credit departments as they are known today have come into being during the life of this Association. They came because specialization meant efficiency and efficiency security, for credit granting can no longer be a matter of guess-work; haphazard methods mean failure more certain than formerly. Modern business has grown to such a size and complexity as to require scientific methods in its administration and as a consequence the demands upon the credit man have become such as to call for a training more and more exacting.

Also the steadying influence which the developing of the credit department has exerted upon general business cannot be exaggerated. Through it (1) inquiries into the credit standing of customers have become more searching; (2) the property statement as a basis for credit granting has been developed and put into common use; (3) mercantile agencies have been induced to provide prompter, fuller and more exact information; (4) better bookkeeping systems throughout the trade are being insisted upon; (5) earnest campaigns have been inaugurated looking to the elimination of abuses such as unearned discounts, unfair claims, cancellations, etc., which are eating close to the heart of profits; (6) dangerous tendencies such as over-selling have been discouraged; (7) the retailer is being educated to the necessity of protecting his credit standing, to the essentials of successful merchandising and to the fact that his interests and those of his creditors are not hostile.

Recognizing the advantage of exact, uncolored facts in determining the degree of hazard accompanying each risk, over 60 per cent of the local associations of credit men have established "bureaus for

exchange of credit information" by means of which the strength and weakness in the standing of a customer can be determined with an exactness not possible through any other means.

The aim of the Association for the elimination of waste in commercial transactions has led it into the field of arbitration, and its committee on this subject is at work determining what changes in the laws of the states must be brought about to make effective the decisions of arbitration courts, has formed what it hopes will become a model statute which it will endeavor to pass in the leading states, and is arousing a general interest among business men on this subject. Already in several centers arbitration facilities have been set up and are doing highly satisfactory work.

C. FORECASTING SERVICES[1]

How can the business manager foretell approximately when prices and costs are going to change and accordingly adjust his financial policies? In the case of short-run price fluctuations (say daily or weekly or monthly) contracting out, hedging on speculative exchanges, etc., are available devices in some cases. Customary prices and relatively stable demand may assist in others. In still other cases experience and intuition count for much. When it comes to forecasting price changes concomitant with the business cycle, however, the manager may do one of three things: (*a*) Select, compile, and organize significant data after a study of many scattered sources of material, e.g., crop reports, financial periodicals, trade journals, etc., and on this basis attempt to reach conclusions concerning future price trends. (*b*) Subscribe to one or more "financial services" sold by organizations which select, compile, and organize the data for him. Much of this material comes from sources listed above. (*c*) Combine methods (*a*) and (*b*).

To suggest the utility of the "financial services" is the purpose of this paper. First, let us indicate some points common to nearly all of the services: (*a*) Certain "indexes" of business conditions are selected, e.g., unfilled steel orders, bank clearings, etc., after a study of past cycles has seemed to indicate their value in anticipating or reflecting business trends. (*b*) Next, a period is selected which represents, at least in the mind of the compiler, "normal" business conditions. The indexes for this period are combined and assigned an index number, say 100. Consequent changes, as reflected by the

[1] By S. P. Meech.

indexes thus combined, are considered as representing a period of prosperity in case the index average rises above 100, liquidation and depression in case the index number is declining or falls below the 100 "norm." (*c*) This composite index is typically visualized by means of a statistical graph. (*d*) Charts of the individual indexes usually accompany the composite chart. These charts show the value and weight changes (in dollars, pounds, etc.) of the individual indexes. (*e*) Frequent bulletins furnish illuminating discussions of the charts. The cause-and-effect phase of trends is given detailed attention and conservative policies are suggested. (*f*) Special investigations confined to particular lines of business or to particular problems are obtainable for an extra fee.

If we examine these various services we find that from one of the best of them, for the price of $100 a year, the manager receives: (*a*) a monthly business review and index chart; (*b*) advance letters notifying of important changes in business conditions; (*c*) supplements containing special investigations in fields of general importance, e.g., railroads, steel industry, etc. This service makes use of three graphs: (1) the speculative graph—security prices and New York bank clearings—anticipating by from two to four months the changes in; (2) the industrial graph—wholesale prices, pig-iron production and bank clearings exclusive of New York—anticipating by from four to six months the changes in; (3) the banking graph—interest rates and loans and deposits of New York banks.

Now let us take a case to illustrate the utility of these services to the manager. The executive who consulted them in late 1919 observed that business was approaching a period of liquidation. The charts indicated that the individual indexes which vary directly with prosperity were reaching new high levels and that those which vary inversely with prosperity were reaching new low levels. He found that bank reserves were dangerously low, interest rate going up, loans and deposits reaching enormous heights. He saw that stock prices and speculative trading in securities were cut short by the rise of call rates as money conditions tightened. He noted the decline of exports and the unfavorable condition of exchange rates. He observed that iron and steel production and prices were very high, that commodity prices were going up, but at decreased speed. The composite charts indicated a general trend in harmony with that shown in the individual indexes. Speculative graphs showing a tendency to decline, production graphs easing up, and banking graphs indicating enormous credit

expansion—all this raised the question as to how much longer the orgy of speculation and spending would continue. The bulletins sounded warnings by pointing out that retail demand was slackening, due to the inability of wages, salaries, and interest incomes to keep pace with the cost of living. The decline of foreign demand was emphasized and the long-run effects of the world's economic recovery and unfavorable exchange rates on export markets for our agricultural and manufactured products stressed. The relation of foreign demand and farming prosperity, now that bumper crops were assured, indicated that prices of farm products were due for a fall. The increased supply of raw materials in various lines was said to indicate the return of somewhere near pre-war conditions of supply and demand and hence of price. The dangerous conditions of bank reserves were pointed out, and the warnings and pleas of the Federal Reserve Board that expansion must stop and that loans must be curtailed brought prophecies of tight money and deflation as a necessary consequence. Purchasing agents in particular lines were warned to go slowly in buying and to work off inventories on their shelves as steadily as possible. Weekly reports of demand for goods and supplies of materials indicated that an adjustment of the two forces at a lower price level was a matter inevitable sooner or later.

In the light of these facts and predictions several steps might well have been taken: (1) Expansion policies might well have been curtailed, for fixed capital costs were too high, due to high building costs, high interest rates, and approaching liquidation. Furthermore, large and high-priced inventories become unliquid very quickly once demand goes on a "buyers' strike." The need was for a reduction of inventories to avoid depreciation. (2) Cash should have been conserved and strengthened and bank loans paid off. (3) Long-time financing at high rates should have been postponed, if possible, and the issue of short-term notes avoided lest they come due at a time when sales are at a low ebb and collections slow.

The foregoing are merely suggestive of some of the policies that might have been profitably pursued in the face of conditions which the data furnished by the services indicated. It goes without saying that the facts of each case and the conditions prevalent in each industry should determine any policies adopted.

The services may be regarded as labor-saving devices lightening the job of keeping up with changes in price trends. Information

otherwise impossible to secure may, through the specialization which has occurred, be placed in the executive's hands in time and in such a shape as to be immediately useful.

9. AN OMNIBUS FINANCIAL INSTITUTION, THE TRUST COMPANY[1]

The usual functions of a trust company are: banking in a more or less limited form, execution of corporate trusts, execution of individual trusts, care of securities and valuables. In addition, other functions are sometimes exercised, such as life, title, and fidelity insurance, and the business of becoming surety. The earlier companies in the United States were chartered to manage individual estates only and to act in certain fiduciary capacities; the recent development of the trust company has been in the direction of banking functions and corporate trust business.

Banking.—The banking functions of trust companies may include any or all of the following:

The receipt of money deposits payable on demand and subject to check, or payable at a fixed date, or according to special agreement. Interest is usually allowed on all deposits above a fixed maximum amount or on the total sum.

Money advances secured by the hypothecation of stocks, bonds, life insurance policies, bonds and mortgages, or other personal property.

Real estate loans, secured by bond and mortgage. It is customary to loan not over two-thirds of the value of improved property; when the property is unimproved, not more than half.

Discounting paper is engaged in principally by companies transacting a commercial banking business. The purchase of unsecured paper is permitted in some states where discounting is not allowed.

The purchase and sale of securities.

Trust companies sometimes guarantee issues of bonds, or at least set their stamp of approval upon them.

The issue or guarantee of letters of credit, and the transaction of a foreign exchange business.

The care of savings deposits. For this purpose a separate department is usually maintained.

[1] Adapted by permission from F. B. Kirkbride and J. E. Sterrett, *The Modern Trust Company, passim*, pp. 5–6. (The Macmillan Company, 1905.)

Corporate trusts.—Among the most important functions of a trust company are those relative to the business of other corporations.

As trustee under corporate mortgages and trust deeds, the trust company acts for the bondholders. It is customary for it to authenticate each bond issued subject to the provisions of the mortgage, to represent the bondholders in case of default, and to exercise such other functions as may be provided in the mortgage.

As trustee under mortgages securing bond issues, the title to the mortgaged property is vested in the trust company for the benefit of the security holders. The corporation owning the mortgaged property retains physical possession of it so long as the terms of the obligation are complied with, except in the case of securities pledged, which are usually lodged with the trustee. In case of default, however, it devolves upon the trustee to protect the interests of the bondholders, and this may necessitate the foreclosure of the mortgage and sale of the property.

As fiscal agent it dispenses coupon and interest payments on bond issues, and dividends on stock. It receives sums set aside as sinking funds to provide for the retirement of obligations at maturity, or when bonds are subject to redemption, draws the specified amount by lot and pays the principal.

As registrar the trust company authenticates certificates of stock and bonds in order to prevent an over-issue, and to reduce the chance of loss or theft. As transfer agent, the company attends to perfecting transfers of ownership for stock and bond issues or parts thereof.

As manager of underwriting syndicates, the trust company issues the prospectus and markets the securities of corporations which are being launched, or of established companies which are putting out new securities.

In railroad and other reorganizations, the trust company takes a prominent part, acting both as a depository for, and as a representative of, the committees which formulate and execute the plans of reorganization. Its officers often have a large share in the preparation of such plans.

As assignee and receiver, the trust company acts in the same capacity for corporations as for individuals and firms or partnerships, assisting in winding up insolvent businesses and in conducting embarrassed ones.

Individual trusts.—The execution of individual trusts is the function originally assumed by trust companies. The various other forms of business which are now engaged in, have, with the exception of life insurance, been later developments of the trust company idea. The earliest power granted these companies was to receive moneys or other property, real or personal, in trust. The trust company now also acts as executor and administrator of the estates of decedents.

The trustee's duty in investing the funds is a double one; namely, to invest them securely so that the principal shall be preserved intact, and to invest them as productively as possible under his powers, so that they shall yield the best rate of interest obtainable for the benefit of the person or persons entitled to the income. He must hold the scales evenly, regarding scrupulously his duties to all beneficiaries. The popular idea that security is the only consideration is erroneous, as the trustee is equally bound to invest the funds as profitably as possible and cannot neglect one duty more than the other.

Other functions.—The trust company acts as guardian, curator, or committee of the estates, and, in some states, of the persons of minors, those who are insane or mentally incompetent, spendthrifts, drunkards, and any other persons not legally qualified to take charge of their own affairs. In the case of a minor, the trust terminates on the ward's becoming of age; in other cases, when the disability is removed, or in accordance with a decree of court. These appointments are frequently made by order of court, and to it accounting must be made. In some states the company is styled "conservator" when caring for the estates of persons of unsound mind.

10. SOME INSTITUTIONS USED INDIRECTLY BY THE MANAGER

A. INSURANCE COMPANIES[1]

[The life insurance company is here taken as typical of all such institutions.]

From a financial point of view the life insurance company is a device for accumulating savings which shall be returned, not to the man who saves, but to his heirs at his demise. Some of the insured, it is true, die long before the sum of the premiums they have paid equals the sum that the insurance company has agreed to pay at their

[1] Adapted by permission from A. S. Johnson, *Introduction to Economics*, pp. 320-21. (D. C. Heath and Company, 1909.)

death. On the average, however, the insured live long enough so that their premiums, together with the earnings of the capital which those premiums form, are at least equal to the sums which the insurance company pays out in death claims.

It is obvious that in a country like the United States, where life insurance is exceedingly common, immense sums of money must be collected by the companies every year to be held as a reserve against death claims. As the business of life insurance is steadily growing, the funds accumulated by these companies are also increasing. The annual receipts of practically every important life insurance company exceed the annual disbursements. Accordingly, a life insurance company may invest its funds without much regard to the possibility of turning its investments into cash at short notice. It is important, however, that the business should be conducted in a conservative manner, since the failure of an insurance company would be a more widely felt calamity than the failure of almost any other business enterprise of equal magnitude. The loss would be borne in the end largely by the dependents of propertyless men.

The reserves of life insurance companies are largely invested in real-estate mortgages, in state and municipal bonds, and in the bonds of railway, commercial, and industrial corporations. Stock investments have often been made by insurance companies, but the practice is now generally regarded with disfavor, since the values of stocks are likely to show a wide range of fluctuation.

B. THE SAVINGS BANK[1]

The chief business of a savings bank is to receive deposits, invest them in certain classes of securities specified in the statute, and pay to the depositors the amount due them, either in whole or in part, as they may from time to time demand.

We can distinguish a savings bank very clearly by this "hall mark": If it receives money not subject to check but payable on presentation of pass book and due notice, which pass book by its terms constitutes the contracts of deposit, and invests the funds in mortgage loans and certain legalized bonds, collateral and personal loans, it is a savings bank; if, on the other hand, it discounts commercial paper, handles checking accounts, loans on notes of hand—in short, does a "commercial" business, it is not a savings bank.

[1] Adapted by permission from W. H. Kniffin, *The Savings Bank and Its Practical Work*, pp. 1–83. (The Bankers' Magazine, 1912.)

The services rendered by the savings bank are many and varied; but as a broad statement it may be said that it acts first, as a vast *collector* of wealth, a storehouse, as it were; and, second, as a great *distributor* of wealth. Like a sponge, it must first gather in before it can give out. In its ingathering it serves the individual, and in its distribution it serves the individual, the community, and the state. It is, perhaps, the greatest assembler of money the world knows, and is one of the chief sources of available capital for municipal and corporate enterprises.

The investments of the savings banks of this country may roughly be classified into: first, government bonds; second, state bonds (usually with a provision that default shall not have occurred within a certain time); third, mortgage loans (which are quite universal); fourth, city, county, town, and school district bonds (particularly of the state in which the bank is located, and frequently in other states, with stipulations as to the population and the debt); fifth, railroad bonds; sixth, street railway bonds; seventh, corporation bonds; eighth, bank stock; ninth, corporation bonds and stocks; tenth, collateral loans; eleventh, personal loans; twelfth, commercial paper; and thirteenth, miscellaneous investments.

C. STOCK EXCHANGES[1]

Much that is to be condemned appears in their conduct. But they are after all productive institutions. They play useful, almost indispensable, rôles in the economic order. Their most important function is to render more efficient the capital of the country.

a) They make investment easy.

b) They make withdrawal from an investment easy, and, in so doing, make capitalists more disposed to invest.

c) They bring together all classes of investments, make clear their disadvantages, and so appeal to all classes of investors, e.g., those who wish above all security; those who demand a chance for large returns; those who can wait indefinitely for returns of any sort; etc.

d) They make the properties represented in stocks and bonds perfectly available as a basis for loans. (Banks will readily accept such bonds and stocks as security, seeing that there is a continuous and unlimited market where these properties can be disposed of at almost any moment.)

[1] Adapted by permission from F. M. Taylor, *Principles of Economics*, pp. 295–96. (University of Michigan, 1916. Later published by the Ronald Press Company.)

e) It is worth noting that the stock market furnishes government with the best available clue to the value of corporate properties when these are needed for the purposes of taxation or social control.

D. WALL STREET[1]

New York is the gateway of the nation's commerce, and Wall Street has been likened to a toll-gate, to pass which every product of the country must pay tribute. As no one likes to pay toll, this would account for much of the animosity so often manifested against the financial center. Yet someone must make, maintain, and operate the various agencies by which the products of the country reach the markets, and it is right that the service should be paid for.

Wall Street is the directing head of the great system of transportation, using that term in its broadest significance, as including, not only the railroads and steamships, but also the banks and exchanges, and all the other manifold agencies by which the products of the soil are brought to the homes of consumers in forms fit for human use. Wall Street, in its financial machinery, facilitates the natural flow of money, provides the means for the promotion of enterprises, safeguards and assists the movement of commerce, and maintains that system of credits by which a tenfold power of service is given to every dollar.

By the machinery of its stock market it promotes the diffusion of wealth; it makes possible for great capital to be accumulated for vast undertakings, governmental and private, too big for individual effort; it enables a multitude of small capitalists to become partners in these big enterprises, by its agencies for the distribution of securities from the hands of producers into the hands of investors as the ultimate consumers; and it is able by its speculative machinery to anticipate human needs, and to secure a more even and equitable level of prices. For this work it must be paid; call it a fee if it be regarded as professional service, call it a toll if it is thought to liken Wall Street to a gate, or a tax if one prefers to speak of Wall Street as exercising legislative power, or a price if it is thought more proper to regard Wall Street as a merchant selling credit and securities for the most they will bring. But whether a fee, a toll, or a price, it cannot be disputed that Wall Street earns a reward for an indispensable service.

Wall Street is the seat of (1) the stock market; (2) the money market. Each is distinct from the other, but both are interdependent.

[1] Adapted by permission from S. S. Pratt, *The Work of Wall Street*, pp. 45–48. (D. Appleton and Company, 1912.)

The stock exchange is the head of one and the bank clearing-house of the other.

The stock market is a place where securities may be bought or sold (*a*) for investment; (*b*) for speculation.

The money market is in four main divisions, all closely allied to each other and having many subdivisions: (*a*) foreign exchange, by which the operations of international enterprise and international commerce are financed; (*b*) domestic credits, by which, through checks and commercial paper, food and merchandise are marketed and the manifold needs of inland trade cared for; (*c*) promotion, by which corporate and other large enterprises are created, underwritten, and financed; (*d*) stock-exchange loans, both on call and time, by which investment and speculative transactions in securities are made possible.

C. Financial Policies and Occasionally Used Devices

We saw in the preceding section the institutional life which the manager may use in his financial problems. In Section C and in the succeeding section we shall be concerned with an account of how the manager works out his policies, by way of various technical devices, through these institutions—or at least largely through them.

As a means of facilitating our discussion, this material is arbitrarily divided into two parts. The first part (treated in the present section, pp. 429–69) is given to a study of the manager's use of relatively infrequently used devices, such as stocks and bonds, in the working out of his financial policies. Stated another way, it is given to a study of *some* of the ways by which the manager raises, expands, and contracts capital. No one should gather from this statement, however, that the expanding or contracting of capital is an infrequent thing. Quite the contrary, fluctation of capital is the characteristic thing in a going concern. How true this is will be clearer after we have studied Section D (pp. 469–512). For the present, let us be aware that we are now examining the devices which are used relatively infrequently in bringing about shifts in volume of capital.

The method used in presenting the material of Section C is as follows: The discussion opens with Selection 11, which gives a general view of what is meant by capital, capitalization, and the various theories of capitalization. Selections 12–17 then present an account of the various kinds of corporate securities, treating them as devices

of which the manager makes use. The remainder of the section (Selections 18–22) is devoted to a study of some of the more important financial policies which may be worked out through the corporate securities. On all of these subjects we must, in such a rapid survey, be content with the "sampling" method. We look at one significant sample after another of both devices and policies.

Partly because of the dominant position of the corporation in our business life and partly because corporate policies and practices can without great difficulty be "translated" into policies and practices for a partnership or an individual proprietorship, the material of this section bears primarily upon problems of corporate finance. The student will have little difficulty in applying the principles involved to the other forms of the business unit.

PROBLEMS

1. Make a list of "theories" or "bases" of capitalization of corporations.
2. "Overcapitalization means capitalization over and beyond proper capitalization." Grant it. What is proper capitalization?
3. Explain what is meant by saying that the issuance of stocks and bonds is a contractual matter.
4. Where can one find the "terms of the contract" under which a certain stock is issued? Is it on the stock certificate? In the corporation charter?
5. What is meant by "the law of the land"? Does it refer to the charter? To the companies act of the state? To the state constitution? To the general body of contract law? To the common law?
6. "On pressing the inquiry, we are able to find several main formative influences which explain the various developments of corporate capitalization. The desire to apportion the elements of risk, income, and control involved in an enterprise largely accounts for the numerous forms of securities." Explain.
7. It is generally said that stocks represent ownership and bonds represent a loan made the company. Is "ownership" a single, absolute, matter or may there be "grades" of ownership? Could bonds have voting power?
8. The students should know the meanings of the following terms: capitalization; capital; shares; stock certificates; preferred stock; cumulative preferred stock; participating preferred stock; convertible stock; guaranteed stock; special stock; overissued stock; unissued stock; founders' shares; outstanding stock; watered stock; authorized stock; redeemable stock; deferred stock; treasury stock; nonassessable stock; full-paid stock.

9. Classifications depend upon points of view. Draw up a diagrammatic classification of stocks. Try to weave in the foregoing terms.
10. The student should know the meanings of the following terms: mortgage bond; first mortgage bond; junior bond; senior bond; overlying bond; underlying bond; prior lien bond; income bond; debenture; participating bond; profit-sharing bond; joint bond; sinking fund bond; terminal bond; divisional bond; collateral trust bond; refunding bond; deferred bond; extension bond; extended bond; optional bond; gold bond; serial bond; convertible bond; registered bond; coupon bond; improvement bond; lottery bond, drawn bond; branch line bond; receivers' certificates; land grant bond; guaranteed bond; dividend bond; interest bond; purchase money bond; car trust bond.
11. Draw up a diagrammatic classification of bonds. Try to weave in the foregoing terms.
12. Define par value; face value; real value; market value. Is there any fixed relationship between par value and market value?
13. "Where the preferred shareholders are in the minority they should see to it that their stock is cumulative." Why?
14. "By this time the reason must have become clear for the veto power so frequently given preferred stocks, requiring the assent of preferred shareholders to any increase in bonds or preferred; or, generally, the purpose of the veto given any class of security on an increase in the amount of that class or any class having a prior claim on earnings or assets." What are these reasons?
15. How does preferred stock facilitate reorganization after bankruptcy? incorporation of a business heretofore conducted as a partnership? forming industrial consolidations?
16. Which would you rather have: common stock or preferred stock?
17. Do you understand that corporate securities may properly be issued to secure working capital?
18. "The more shareholders there are in a particular corporation the fewer the shares that can control." Explain. Is this always true?
19. "There are cases where a corporation may ask no further payments on stock from its stockholders, but where creditors of the corporation may demand them." Explain. Remember stock certificates represent contracts.
20. What factors determine the amount of capital stock of a corporation? the amount of bonds?
21. What is a deed of trust in connection with a bond issue? What does it contain?
22. Define or explain: closed mortgage; open end mortgage. In the case of the open mortgage, protection of the investor should be cared for. Why? How?

23. "Whether bonds shall be issued under an open or a closed mortgage presents another consideration of marketability. Doubtless the investing public generally prefers a closed mortgage." Why?
24. When is it appropriate to use a sinking fund? How can one determine the amount which should be devoted annually to the sinking fund?
25. "The desirability of any given plan of amortization may be tested by the following five considerations: (*a*) adequacy of the sinking fund or redemption payment; (*b*) certainty of payments; (*c*) reasonableness of the distribution of the burden upon the corporation; (*d*) effect of the plan upon the market for the bond; (*e*) expense and labor involved in the plan." Illustrate each point. Should every corporation have a sinking fund?
26. "We should remember, however, that paying the creditor and paying the debt are very different matters." Explain.
27. What are the advantages and disadvantages of convertible bonds?
28. Why are there so many kinds of bonds?
29. "Why do corporations borrow? Why create a debt, which must be repaid with interest, when the sale of additional stock would bring funds permanently into the business without a fixed liability for interest?" Answer the question.
30. Is it a good or a bad indication concerning a company when it decides to issue bonds?
31. A corporation has outstanding $1,000,000 of 5 per cent bonds, $10,000,000 of 7 per cent preferred stock, and $10,000,000 of common stock. Gross annual earnings are $11,950,000; total expenses for the year are $9,900,000 in addition to depreciation of the plant amounting to 10 per cent on a valuation of $11,000,000. What is the amount available for distribution among the security holders, and how will this amount be distributed among the holders of different securities?
32. In the case of the corporation described in the preceding question what would be the effect upon the dividends of the common stock if all the preferred stock were converted into 5 per cent bonds? Would this be a wise move if the business were likely to fluctuate so that the net earnings of the corporation would be cut in half?
33. A, B, and C are the owners of patent right, which A secured, B and C being his financing partners during the developmental period. It is estimated that probably $40,000 will be necessary to build the plant to manufacture the article, and $15,000 more will be needed for working capital. There is considerable probability of expansion, if the article "takes." It is proposed to create a corporation, and sell the patent to the corporation for stock; and also sell stock to outside investors to obtain developmental capital. What in your judgment should be the amount of capital stock issued? Upon what factors would the amount depend?

34. "There is money market for acquiring loans of capital to carry on the business but there is no money market for original capital." Do you agree?
35. What is a reorganization? How can it be true that after reorganization of a corporation there may be outstanding a greater volume of securities with a smaller annual fixed charge? What is the difference between fixed charges and contingent charges?

11. THE MEANING OF CAPITAL AND CAPITALIZATION

There is no standard meaning for either of these terms, as far as the business world is concerned. One useful definition of *capital* is "the net assets of the business that have been contributed for continuing use." Even with this definition one must be on his guard. Sometimes the term is used in the sense of the money value of these net assets; sometimes in the sense of the "capital goods" themselves. We may use the term *capitalization* to mean the corporate securities, stocks, bonds, and (sometimes) short-term notes. This use is arbitrary and is adopted merely to meet our peculiar needs.

What is "proper" capitalization for a corporation? To this question also there is no short satisfactory answer. We may speak of various "bases" of capitalization. (1) There is the theory that capitalization should be based upon the original cost of the property or the actual investment in the enterprise and that the corporate securities should not exceed this amount. (2) There is the theory that capitalization should be based upon the cost of *reproduction*, and a variant of this is the theory that it should be based upon the cost of reproduction less the depreciation which has taken place. (3) There is the theory that capitalization should be based on earning capacity; that corporate securities may properly be issued to an amount which will equal an appropriate capitalization of earnings. There remains for debate whether actual or expected earnings should be taken as the basis.

There are other "theories" or "bases" of capitalization, but the foregoing will serve to indicate the range of opinion and controversy. The issues are of more importance in the case of public-utility corporations than in the case of ordinary competitive business. If business is *really* competitive, competition is relied upon to take care of the consumer, and protection of the investor becomes the main reason for regulating corporate issues. If the business is non-competitive, both consumers and investors may be interested in being protected.

An interesting illustration of capitalization occurred a few years ago when a large concern took over some smaller ones and in the process issued bonds to the value of the tangible assets of the concerns, preferred stock to an amount representing a capitalization of present earnings, and common stock to an amount representing a capitalization of expected future earnings over and above the present earnings.

See also p. 456. Policies Concerning the Kind and Amount of Securities.

12. CORPORATE SECURITIES VIEWED AS INSTRUMENTALITIES

A

A person coming for the first time into contact with the multitudinous technical devices commonly used in corporate capital formation is likely to be somewhat dazed by the array of forms of stocks, bonds, and short-term notes. Bewilderment is not infrequently followed by fascination and the next stage is an orgy of memorizing terms and factual descriptions in an attempt to see through these very captivating devices which become regarded as a sort of symbol of business opportunity and success. And too many of our textbooks encourage such futility.

It is far more helpful to approach the subject by another path. The truth is that stocks and bonds and other technical devices *are* technical devices which are employed in attaining certain objectives. Like most other devices they are moved about, shaped, and utilized as seems best. They have no invariable form; there is no one unvarying content in the names applied to them; there is no unchanging way in which each is utilized. They are *instruments* and they are molded as seems to the user best in view of the purposes he wishes to accomplish.

These technical devices are at once robbed of much of their mystery if we recall to our minds the fact that, after all, they are merely symbols or evidences of contracts which have been entered into between the corporation and its owners or its creditors, as the case may be. Speaking broadly, such contracts may be entered into in any lawful way and may accordingly have an almost unlimited variety of forms. This shows at once how futile it is to try to catalogue and perchance memorize all the attributes of, let us say, com-

mon stock or preferred stock or mortgage bonds. These and other such names have come into use to symbolize certain rough types of such contracts, it is true, but the contracts are not invariable in form. There may be, for example, scores of variations in common stock or in any other one of these devices. About all one can say concerning the rights and obligations of the parties who have entered into such a contract is that their rights and obligations "depend upon the terms of the contract."

Such a statement appeals to us at once as being true of ordinary contracts. Suppose you are to contract with Claire Louis for him to deliver you some apples for which you are to pay him. How numerous the variations might be in the details! How many apples? What kind? When delivered? Where? What qualities? At what price? When paid? How paid? These are but the beginnings of a long list of possible issues. Well, after all wherein is this different from the case of Claire Louis contracting with a corporation to turn money over to it and the corporation agreeing to give Louis in return certain rights? How much money? When delivered? How delivered? What claims in return? Part ownership? Unsecured claims of an ordinary creditor for the repayment? Provision that the corporation will lay aside earnings in order to be sure to repay? Provision that specific property shall be put in pledge? There is no end to the possibilities.

Let us, for the present, brush aside details in an effort to see the problems of corporate securities in a large way. Let us say that the managers of a corporation have certain objectives in view. For example (1) they wish to secure funds to enlarge the business or (2) they wish to have the control of the corporation in certain hands. They set about having the corporation enter into contracts with various persons looking toward the attainment of these objectives. After these contracts have been drawn it may be said of them, for purposes of quick discussion, that they fall into rough types, but the only place in which one can find out *precisely* what a given contract provides is in that contract. New varieties of such documents emerge continually as new contracting parties find some new way desirable. The new forms emerge in response to the needs of the business community; the needs of the business community are not straitjacketed into a lot of existing forms. It is helpful for a beginner to think of the matter in that light. If he does so think of it, he sees these technical devices as servants and not as masters; as a growing body

of instrumentalities through which the manager may work out his policies.

All the foregoing may be summarized as follows: When a corporation issues stocks and bonds, it enters into a contract with the holders. The attributes of the particular security it issues (1) depend upon *the terms of the contract* and (2) this depends upon *the law of the land*. There is almost no limit to the variations which may be made in the contract. The variations which are made reflect policies of business and not respect for terminology.

We must now take steps to see in this summary statement more than appears on the surface. In particular, we must put content into the sentence which says that the attributes of any given security depend upon the terms of the contract and this depends upon the law of the land.

Let us begin by noticing that the corporation is an artificial person, permitted to exist under rules set forth by the government (either state or national, in the United States). It will help us to see the status of this artificial person more clearly if we think in terms of a somewhat extreme statement: "Natural persons may do anything they are not forbidden to do but artificial persons may do only those things they are permitted to do." It follows that a corporation may enter into such contracts in such manner as it is permitted by its creator, the government. Sometimes the rules governing a corporation are set forth in a special enactment of the legislature applicable only to that particular corporation. This is called a special charter. Such charters were the usual way of creating corporations prior to 1850. Today, however, while special charters are occasionally granted, the ordinary procedure is this: The legislature passes a general act (the companies act or the general incorporation law, it is likely to be called) setting forth general rules governing all corporations which get charters under that act, and the actual granting of the charter is made an administrative act. It is performed, generally by the Secretary of State, according to rules laid down in the companies act.

Suppose, now, that a corporation has been formed under the companies act of the state of Illinois, and that it has "issued" some stock of that general type known as "preferred." How could a person contemplating a purchase of such stock ascertain his rights and obligations? Generally, such an investigation should be left to

an expert, if much depends upon the accuracy of the outcome but in an ordinary case any layman can secure the main facts. To begin with, the outstanding features are likely to be set forth in the stock certificate. But even so, the stock certificate, if it is to be enforceable, must be drawn in conformity with the charter since the artificial corporation must act according to the rules governing it. Most of these rules will not appear in the charter; they will be found in the companies act. And there is much in the region back of the companies act. There is first of all the state constitution and for some purposes even the federal constitution. Again there is the great body of common law which is used to interpret any doubtful parts of the statute law (in this case a companies act) and which also fills in the inevitable gaps which will be found in any statutory statement. And, again, there may be some statutes other than the companies act which must be considered. "The terms of the contract" thus reach back far into "the law of the land," and only experts should be called upon to draft such contracts or to interpret them when much is at stake.

What should this leave in a beginner's mind? He should think of the law as an agency designed to give *certainty* to our relationships and should picture the corporation as a creature of the state brought into existence to meet needs. As a contribution to certainty, the contracts of this creature must be drawn according to the rules governing it but, within those rules, they may have the widest latitude. Do preferred stockholders have voting power? That depends upon the terms of the contract. Are their claims for dividends cumulative? Do they have preference on both earnings and assets (in case of dissolution)? May their holdings be converted into common stock or into bonds and if so upon what terms? It depends upon the terms of the contract.

Now, no one should hide behind a phrase. "It depends upon the terms of the contract" may not wisely be made a substitute for clean thinking. The student will accordingly be expected to know *in general* what each main type of security *usually* represents in rights and obligations. But he must realize that every case is a different case and that these contracts may be drawn to meet the needs of the case. The problem before a financial manager in a given instance is that of determining what should appear in the particular contract which he is causing to be drawn.

B[1]

The corporate form immediately divides, or marks the line of division of management, into administration and control. Shareholders possess control, but through directors delegate administration to officers. Varying rights given special classes of stock make a widely varying apportionment of income, control, and risk. Common shareholders accept a maximum of risk in expectation of a maximum of income. They may share the incident of control equally or in varying proportions with other classes of stock. Sharing control in varying proportion does not mean here through unequal divisions in the total *amounts* of common and other classes of stock, but that each share of one class represents an essentially different amount of control from each share of the other.

If two classes of stock enjoy exactly equal rights, except that one has a preference as to income and perhaps assets, they do not divide control, but risk, and the combination of control plus risk in one, as compared with the combination of control plus risk in the other, makes the ownership represented by one class entirely different from the ownership represented by the other. But the rights may differ, aside from the preference of one as to income and assets or either.

We may speak of these divisions and combinations of income, control, and risk creating different *kinds* of ownership, as horizontal divisions. With that idea in mind we may make a diagram like this representing a simple case:

CAPITALIZATION, $3,000,000

$1,000,000 common stock	Greatest risk: half present control; no limitation of income.
$1,000,000 preferred stock	Less risk: half present control; limited income.
$1,000,000 first mortgage bonds	Least risk: little or no present control but contingent complete control; limited income.

Now, if we make some further stipulations about this corporation, as that its net earnings are $200,000, that the preferred stock is 6 per cent noncumulative, and that the bonds are 5 per cent, without

[1] Adapted by permission from W. H. Lyon, *Corporation Finance*, Part I, pp. 7–11. (Houghton Mifflin Company, 1916.)

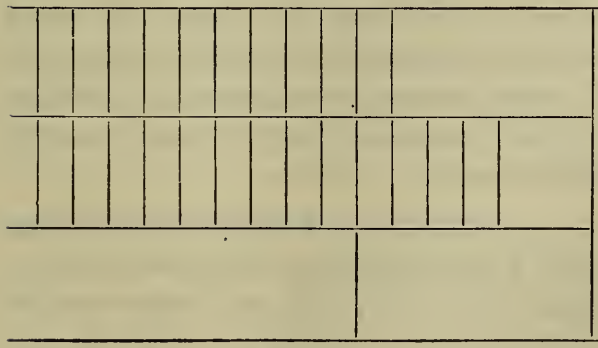
any rights of control contracted for except the right of foreclosure on default of payment of interest or principal, we can make the diagram a little more definite:

CAPITALIZATION, $3,000,000

$1,000,000 common stock	Great risk: 50 per cent of actual present control; 45 per cent of present income which may increase in amount.
$1,000,000 preferred stock 6 per cent noncumulative	Much less risk: 50 per cent of present control; 30 per cent of present income, which cannot increase in amount.
$1,000,000 5 per cent first mortgage bonds	Least risk: no actual present but full contingent control: 25 per cent of income which cannot increase in amount.

We have not yet mentioned another division of ownership, that represented by the *number* of shares of stock or the *number* of bonds. Though, in practice, corporation financing carries this division much further than private financing, the division itself is not peculiar to the corporate form. It appears in the partnership as complete in its nature as in a corporation, and makes a division into *amount* of ownership rather than *kind*—into *quantity* rather than *quality*. To carry out the metaphor of a horizontal division as indicating a division into kinds of ownership, we may call this division indicating quantity of ownership a perpendicular division.

Further, to carry the metaphor into a diagram with the same facts as before, we have:



Common stock, par, $100. Ownership divided into 10,000 parts.

Preferred stock, par, $100. Ownership divided into 10,000 parts.

Bonds, par, $1,000. Ownership divided into 1,000 parts.

Now, these two kinds of divisions of ownership accomplish two very different results. The perpendicular division of amounts of

ownership makes possible the fitting of every man's pocket-book or financial ability. As already stated, however, this is not peculiar to the corporation. A partnership can accomplish it, and to a limited extent in practice has accomplished it. One of three or more partners may have one-third or one-fourth or any other fractional amount of the total ownership. Nothing in the nature of a partnership prevents this from being carried very far, possibly even so far as the quantity divisions of ownership in the United States Steel Corporation or the Pennsylvania Railroad, whose security-holders number tens of thousands.

The horizontal division into *kinds* of ownership makes possible a more difficult fitting than fitting a man's pocket-book. It makes possible the fitting of his type or state of mind. One man may be more or less willing to take a chance than another. The same man may be more willing at one time than another. He may be unwilling to take any risk whatever without having some control.

We cannot consider corporate financing apart from ownership, nor ownership apart from owners. Ownership and owners enter into the consideration as necessarily as the various gases enter into the composition of water. Personal ownership has not developed the ability to fit types and states of mind closely. The fact that corporate ownership has, accounts for a great part, perhaps for the greatest part, of the success of the corporate form of enterprise.

See also p. 734. The Powers of Stockholders.
p. 671. Elimination by Combination of Risks.

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13. A CLASSIFICATION OF STOCKS[1]

[While the student cannot at this time do better than make intelligent guesses, he should read this selection with these questions constantly in mind: Under what circumstances should the manager use this kind of stock? What financial policy has the manager adopted if he issues this kind of stock?]

In the first place, stock certificates may be classified according to their par value. The great majority of important railroad, industrial, and financial corporations have issued stock with a par value of

[1] Adapted by permission from J. Adams, Jr., "Stocks and Their Features—A Division and Classification," in *Annals of the American Academy of Political and Social Science*, XXXV (1910), 325–44.

$100. According to the laws of most states, any par value whatever may be fixed for the stock. Consequently there are par values all the way from one cent, in certain mining and oil-well properties, to a few banks and trust companies, such as the Humboldt Savings Bank, and the Union Trust Company of San Francisco, and the West Side Bank of Milwaukee, each with shares of a par value as high as $1,000.

Some stocks, strange as it may seem, have no par value whatever. The Adams Express Company, a voluntary association, dating from 1854, has 120,000 shares of no stipulated par value, paying dividends of eight dollars per share annually. Similarly, the East Boston Company, a Massachusetts corporation going back to 1833, has 150,000 shares of no par value. Several states have recently made provision for such stock.

A further classification of stock certificates can be made with reference to their issue; i.e., into issued and outstanding, unissued, and treasury stock. Unissued stock is that which has been authorized but not yet disposed of. It merely represents the right to admit new stockholders and has no value in itself. It has no active stock rights and is not an asset of the corporation. It usually is reserved for various corporate purposes, such as the conversion of bonds or the purchase of new lines or plants. Treasury stock, on the other hand, is best described by Wood in words which have been frequently quoted: It is stock "issued and outstanding which has come into the possession of the corporation which issued it by purchase, donation, or in liquidation of a debt. If it has been issued full-paid it remains so, even if sold again below par, and it is considered an asset of the corporation for bookkeeping purposes. But such stock, so long as it is held by the corporation or its representatives as treasury stock, neither participates in dividends nor in the meetings of the corporation as treasury stock; though it still represents a paid-for interest in the property of the corporation." Treasury stock is issued, but is evidently not outstanding. Examples most frequently occur in mining companies.

Stocks can also be classified according to whether they are full-paid or assessable. Full-paid stock is simply that which has been fully paid for as required by law in money, property, or labor. The certificates of such stocks are issued stamped "full-paid and non-assessible," and, in the absence of any special statute on the subject,

carry with them no legal liability. Assessable stock, on the other hand, is that which has not been fully paid for by its subscriber. It should be emphasized, however, that outside of mining and public utilities corporations, assessable shares are comparatively few. Very few instances of such stock are listed on the New York Stock Exchange. The legal status of assessable stock is such that creditors of the corporation can hold the owners of the shares liable for the difference between the amount actually paid in and the par value of the stock.

Turning next to a discussion of the various features of common and preferred stock, we find that the classification, to be complete, must be very elaborate. An outline is inserted to enable the reader to follow more readily the following classification.

CLASSIFICATIONS OF STOCK CERTIFICATES ACCORDING TO THE RIGHTS AND LIMITATIONS ATTACHING TO VARIOUS TYPES OF STOCKS

1. Common
2. Deferred
3. Preferred, as to
   - Dividends (always)
     - Cumulative (industrials, generally).
     - Non-cumulative (railroads, generally).
   - Assets
     - Railroads (not often).
     - Industrials (generally).
   - Voting power
     - Exclusive (seldom).
     - Special (often).
   - Other features
     - Callable.
     - Convertible.
     - Participating.
4. Stocks analogous to Preferred
   - Interest-bearing.
   - Special stock.
   - Guaranteed.
   - Founders'.
5. Debenture

"Common stock," meaning the junior issue, when there is preferred stock, or stock analogous to preferred, sometimes has a real preference in regard to voting, for there are instances where the preferred gives up the right to vote as a consideration for its receiving regular dividends. The usual provision is that if such disbursements are discontinued for a certain period, varying with the individual corporation, the preferred stock shall resume its voting power.

Common stock generally has the right to receive all the surplus remaining for dividends after the preferred has been paid its stipu-

lated percentage; and in a growing country such as the United States this feature is valuable, provided there is any worth in the company.

Common stock usually has the right to share equally with the preferred in the corporate assets on the dissolution of the company. In many cases, however, especially the New Jersey industrials, which include practically all the large "trusts," the preferred stock has a preference in this respect.

"Deferred" stock is an issue commonly used in England, but only infrequently met with in the United States. The name itself is largely explanatory of its nature. It is an issue in which dividends are deferred until dividends on some other variety of stock, or interest on some particular bonds, have been paid.

Having explained the nature of deferred stock, we may now consider *preferred* stock. This class may have a preference in any one, any two, or all three, of three particulars; i.e., dividends, always; assets, generally, and voting power, at times. It may also be "callable," "convertible," or "participating."

Such stock always has a preference over the common as regards dividends, which may be either "cumulative," or "non-cumulative," the former being in the nature of a fixed charge, because if the corporation is unable to pay the dividend in one year, it must be paid in succeeding years, together with the dividends for those years, before the common can receive anything. No such duty attaches to non-cumulative stock. If the dividend cannot be paid this year, the rights of the common to share in next year's earnings are in nowise impaired.

The superior voting right which the common stock sometimes possesses has already been spoken of. The preferred, likewise, in some instances, carries the entire voting power, though not so often as the common, and generally in less important corporations. On the other hand the preferred stock often has a voting preference in regard to special matters—usually in case of the creation or increase of funded debt, or the enlargement of the preferred issue itself. More than a majority of the issue, usually two-thirds to three-fourths, is required to sanction such changes.

Mention may be made here of the various classes of preferred stock, and the safeguard that is occasionally thrown around preferred dividends in the shape of what may be called "dividend funds." The difference between a first and second preferred stock is this: that while both are senior to the common, the first preferred ranks ahead

of the second in regard to receiving dividends, and in some cases has priority as regards assets, also. Of the corporations whose stocks are active on the New York Exchange, only about 5 per cent possess two or more classes of preferred. No instance of a corporation having more than three classes of preferred stock has been found.

It is proper to state here that what is commonly known as "preferred" stock need not necessarily, in many cases, be called by that name at all. Under the laws of many states, stock possessing the characteristics of preferred stock may be known by almost any name, so long as that name does not generally import some other variety of stock. Concord & Montreal has its stock divided into classes I, II, III and IV, class IV corresponding to common stock.

It should next be noted that preferred stocks may possess any one of three special features—they may be "callable," "convertible" or "participating." Very many preferred stocks are issued to procure money for corporate purposes on the inception of the company, when not much could be realized by the sale of common stock, and bonds could be marketed only at a discount. Such companies may have hopes that in time their business will so improve that by issuing bonds at a low interest rate, or by selling additional common stock, they can retire the preferred stock, leaving the common stock in a much better position. Hence the callable feature may be inserted. This is never obligatory on the corporation, but merely optional with the directors. It is the opposite of the "convertible" feature, which depends on the stockholders' option.

The participating feature of certain preferred stocks is comparatively unknown to the public; yet it is of the utmost importance, for it is practically only in this class of preferred stocks that the holder has an income unlimited except by the company's earning power. In cumulative preferred stocks he is nearly always limited to his fixed percentage, but here he shares with the common stock the surplus remaining after a certain amount has been paid on that class.

Following our classification of stocks we may now consider those stocks which are analogous to preferred. The first of these is interest-bearing stock which is really only another name for preferred stock.

"Special stock" is a creation of certain Massachusetts statutes, especially the Acts of 1855 and 1882. Under the latter enactment, manufacturing "and other corporations," by vote of three-quarters of their stockholders at a meeting called especially for this purpose, may authorize "special stock," which must never exceed two-thirds

of the actual capital, bearing semi-annual dividends not exceeding 4 per cent, and subject to redemption at par after a fixed date, which must be expressed on the certificate. The holder of such stock is in no case liable for the debts of the corporation.

"Guaranteed stock" is a term properly applied to the stock of a company, the dividends on which are guaranteed by another corporation, provided there are sufficient earnings to meet them, but not otherwise. It is sometimes erroneously employed as describing preferred stock, i.e., the corporation guaranteeing the dividends on its own stock.

"Founders' stock" is practically unknown in this country. No instance can be found in the manuals, though it may exist in small corporations. Briefly, it may be said to be stock ranking ahead of preferred, entitled to a certain fixed dividend and then to a certain proportion of the surplus after dividends on all classes have been paid.

Having described the various classes of preferred stocks and their characteristics, and those analogous to preferred issues, there still remains for discussion the so-called debenture stock. This class of stock may be said to be on the margin between mortgage bond issues and regular stock issues. To the ordinary person a "debenture" signifies a non-mortgage bond. But it is also used to describe a stock. The whole amount secured may be "treated as borrowed capital consolidated into one mass for the sake of convenience," and certificates issued entitling the holder "to a certain sum, part of this mass." It differs from stock in that the company promises, generally in the form of a covenant, to pay interest on specified dates. This interest has priority over dividends on any class of *stock* whatever, whether guaranteed or not. Such issues are common in England and Canada, but rare in the United States, though debenture bonds are well known here.

In closing, we express the hope that intending purchasers will look well to the class of stock in which they contemplate investing, examining *all* of the provisions of that particular issue; consulting, if necessary, the articles of incorporation of the company.

14. A SAMPLE STOCK CERTIFICATE

NUMBER

SEVEN PER CENT CUMULATIVE PREFERRED STOCK

SHARES

INCORPORATED UNDER THE LAWS OF THE STATE OF NEW JERSEY

United States Steel Corporation

REGISTERED:
NEW YORK SECURITY AND TRUST COMPANY,
REGISTRAR,
by
ASS'T SECRETARY.

This is to Certify that _____

is the owner of _____ fully paid and non-assessable shares of the par value of one hundred dollars each, in the **PREFERRED CAPITAL STOCK** of United States Steel Corporation, transferable only in person or by attorney upon the books of said Corporation, upon surrender of this certificate. The holders of the preferred stock shall be entitled to receive, when and as declared, from the surplus or net profits of the Corporation, yearly dividends at the rate of seven per centum per annum, and no more, payable quarterly on dates to be fixed by the by-laws. The dividends on the preferred stock shall be cumulative, and shall be payable before any dividend on the common stock shall be paid or set apart: so that, if in any year dividends amounting to seven per cent shall not have been paid thereon, the deficiency shall be payable before any dividends shall be paid upon or set apart for the common stock. Whenever all cumulative dividends on the preferred stock for all previous years shall have been declared and shall have become payable, and the accrued quarterly installments for the current year shall have been declared, and the company shall have paid such cumulative dividends for previous years and such accrued quarterly installments, or shall have set aside from its surplus or net profits a sum sufficient for the payment thereof, the Board of Directors may declare dividends on the common stock, payable then or thereafter, out of any remaining surplus or net profits. In the event of any liquidation or dissolution or winding up (whether voluntary or involuntary) of the Corporation, the holders of the preferred stock shall be entitled to be paid in full both the par amount of their shares and the unpaid dividends accrued thereon, before any amount shall be paid to the holders of the common stock; and after the payment to the holders of the preferred stock of its par value and the unpaid accrued dividends thereon, the remaining assets and funds shall be divided and paid to the holders of the common stock according to their respective shares. The preferred stock and the common stock may be increased as provided in the Certificate of Incorporation. This certificate is not valid without the signatures of the Transfer Agent and Registrar of Transfers. **WITNESS** the signatures of the President, or of a Vice-President, and of the Treasurer or of an Assistant Treasurer, of said Corporation.

by
HUDSON TRUST COMPANY,
TRANSFER AGENT,
ASS'T SECRETARY.

ASS'T TREASURER

VICE-PRESIDENT

SHARES $100 EACH

[Form of Assignment on the Back of the United States Steel Corporation Preferred Stock Certificate]

*For value Received*____*hereby sell, assign, and transfer unto*

_____

_____ *Shares of the Capital Stock represented by the within Certificate and do hereby irrevocably constitute and appoint*

_____ *Attorney to transfer the said stock on the Books of the within named Corporation with full power of substitution in the premises.*

*Dated*_____*19*____

_____

In Presence of

_____

NOTICE: THE SIGNATURE TO THIS ASSIGNMENT MUST CORRESPOND WITH THE NAME AS WRITTEN UPON THE FACE OF THE CERTIFICATE, IN EVERY PARTICULAR, WITHOUT ALTERATION OR ENLARGEMENT, OR ANY CHANGE WHATEVER.

15. A CLASSIFICATION OF BONDS[1]

A comprehensive basis for the classification of bonds is not to be found in the bond lists nor in current market reports. The names and classes thus arranged are for purposes of convenient reference and usually follow the practice of the local exchange. Generally speaking, bonds receive their titles from one or more of the following characteristics: (1) the character of the corporation using them; (2) the purpose of issue; (3) the nature of security given for payment; (4) the terms of payment; and (5) evidence of ownership and transfer. The first of these five characteristics is used as a basis for general classification. That is to say, quotations are usually arranged under the following heads:

Government—state and national.
Municipal and county.
Railroad, express, and steamship companies.
Traction companies.
Gas, electric light, and water companies.
Bank and trust companies.
Investment companies.
Industrials.
Mining companies.
Miscellaneous.

Classification according to purpose of issue.—Among the many varieties of bonds which take their names from the purpose of issue the following may be noted:

Adjustment bonds, bridge bonds, construction bonds, consolidated bonds, car trust bonds, dock and wharf bonds, equipment bonds, extension bonds, founders' bonds, ferry bonds, general bonds, improvements bonds, interim bonds, interest bonds, purchase money bonds, refunding bonds, reorganization bonds, revenue bonds, subsidy bonds, terminal bonds, tunnel bonds, temporary bonds, unified bonds.

Classification of bonds according to the character of security provided for payment.—From the point of view of the security given for payment, bonds fall into two general classes, viz., (1) unsecured, and (2) secured. The secured bonds may again be divided into two general classes: (*a*) those having personal security, and (*b*) those

[1] Adapted by permission from F. A. Cleveland, "Classification and Description of Bonds," in *Annals of the American Academy of Political and Social Science*, XXX (1907), 400–411.

secured by liens on specific property. These in turn may be subdivided as follows:

I. Unsecured
   a) Government bonds
   b) Corporate debentures
II. Secured
   a) Personal security
      1. Indorsed bonds
      2. Guaranteed bonds
         (*a*) Guaranteed as to principal
         (*b*) Guaranteed as to interest
         (*c*) Guaranteed as to both principal and interest
   b) Lien security
      1. By character of property pledged
         (*a*) Real property
            (1) Land grant bonds
            (2) Real estate bonds
         (*b*) Personal property
            (1) Collateral trust bond
            (2) Sinking fund bonds
      2. By the character or priority of lien
         (*a*) First, second, or third mortgage bonds
         (*b*) General mortgage bonds
         (*c*) Blanket mortgage bonds
         (*d*) Consolidated mortgage bonds
         (*e*) Income bonds
         (*f*) Profit-sharing bonds
         (*g*) Dividend bonds
      3. By character of the holding participation receipts

Bonds classified according to evidence of ownership and transfer.—Considered from this viewpoint there are three classes, viz., coupon bonds, registered bonds, and coupon registered bonds.

Coupon bonds are issues, the contracts for payment of interest on which are evidenced by separate coupons or contracts for payment, which fall due consecutively on the interest-paying dates. The coupons may be detached and constitute complete promissory notes in themselves, payable to bearer. The coupons are usually written on small sections of a sheet of paper attached to the principal obligation and as they mature are clipped off and presented for payment.

They are frequently presented for payment through a bank as a check or draft would be.

Registered bonds are credit instruments, the interest obligation in which is expressed in the same writing or paper as in a promissory note, the ownership of the bond being registered as a means of protecting the payee against loss, necessitating a formal transfer and registration to transfer the title when the old instrument is canceled and a new one issued. Interest is payable by money delivery or by check sent by mail to the address of the registered holder. Notice should be given of any change in address.

Registered coupon bonds are issues, the principal of which is registered, the coupons being made payable to bearer.

In practice a single bond issue may have any number of these many distinguishing characteristics, so long as they are not in conflict. When applied to specific issues the number of classes may be equal to the mathematical possibility of the several elements described in combination. The advantage of the analytical classification here used is that by classifying and defining bond characteristics the terminology may be understood in any combination used.

16. RECITALS IN BONDS[1]

A bond ordinarily is simply a promise to pay money at a given time, bearing a rate of interest, the interest usually being payable at stipulated intervals—annually or semi-annually. Such a bond is sometimes defined as *an instrument in writing, under seal, whereby one binds himself to pay a certain sum of money to another on a day named.*

The essential recitals to be made in a bond depend largely upon the statutes and laws governing the issue. It is necessary to have a knowledge of the statutes under which the bond is sought to be issued, in order to be sure of all the recitals which should enter into any particular issue of bonds. It is quite a common practice to select some bond form which has been evolved by long continued experience and adopt and copy such a bond. Such practice is much better than to approach the subject in a haphazard manner, but no bond form should be adopted without careful investigation of the authority by which it is issued and the conclusion arrived at that the bond complies in all respects with the authority granted. These observations apply to

[1] Adapted by permission from Andrew Squire, "Essential Recitals in the Various Kinds of Bonds," in *Annals of the American Academy of Political and Social Science*, XXX (1907), 248–56.

what may be called the unusual recitals in bond forms. Some of these recitals are not essential, but at times the recitals, if they are to become part of the contract between the obligor of the bond and the one who buys it, are very essential, and it becomes very necessary to have the exact terms clearly expressed.

A bond written in any unusual phraseology is liable to attract attention and raise questions that might hinder the negotiation and sale of a bond that would not attract attention if written in the ordinary terms.

A bond secured by mortgage, whether real estate, chattel or collateral trust, should usually, in addition to containing the obligation to pay, advise the bondholder, either directly or by reference to the mortgage, of his rights and of the terms and conditions upon which the bond is issued and secured.

Ordinarily, a proper form of mortgage bond will set forth:

a) An acknowledgment of the indebtedness for value received.

b) A covenant to pay the principal at a certain place and time, in lawful money, or gold coin of a fixed standard of weight and fineness, with interest at an agreed rate, payable at a specified place, and at specified times, usually semi-annually, and ordinarily represented by coupons attached to the bonds.

c) A description of the issue of which the bond is one, showing usually the amount of the issue, and, oftentimes, the purposes.

d) A statement showing that the bond is secured by a mortgage or trust deed, as the case may be; the place where the instrument is recorded or filed, and a reference to the instrument for a description of the property mortgaged or pledged; the extent and character of the security, and the terms and conditions upon which the bonds are issued.

Usually the bond is specifically made subject to the terms and conditions of the mortgage, so that, should there be any conflict between the terms of the bond and mortgage, or instrument securing the bond, the terms of the mortgage will govern.

e) A recital briefly advising the bondholder of his rights on default of payment of interest or otherwise.

f) A provision that the bond shall not be valid until authenticated by a certificate endorsed thereon and executed by the trustee.

This certificate to be executed by the trustee needs careful attention. It should not be a certificate purporting to be anything more

than an identification of the bond as one of the bonds of that particular issue. The trustee should never represent that the bond is secured by a mortgage or other instrument executed to the trustee, because the trustee is not expected to in any sense determine that the bond is secured, or to what extent it may be secured. All that is asked of the trustee is to identify properly the bond and guard against an over-issue.

In addition to the foregoing there are various special provisions which frequently occur in bonds. For instance:

1. *A provision for registration.*—This in order that the bond, which is usually payable to bearer, may be registered and held so that the owner would not be deprived of his property, should the bond be stolen or destroyed by fire.

2. *A provision for redemption prior to maturity.*—Such provisions are exceedingly common in railroad and corporation issues. Experience has taught those who are in the habit of drawing bonds of this character, that almost every kind of business is liable to develop far beyond the expectations of those interested at the time a bond is put out; and that, in order to finance an increasing business, whether it be a railroad or even an ordinary corporate enterprise, upon which larger demands are being made yearly for capital to be used in the business, additional stock must be sold or additional bonds issued. Sometimes resort must be had to the one method and sometimes to the other. When it is found better to issue new bonds, it is frequently of great advantage to be able to retire the underlying bonds, and it is very wise that the bond should contain a provision permitting such retirement. As a matter of experience, the bond should usually provide for its retirement only at some interest-maturing period.

3. *For a sinking fund.*—The sinking fund provision in a bond is sometimes a difficult one to deal with. [For a discussion of sinking funds, see page 462, Amortization Policies and Practices.]

4. *For the exemption of stockholders, directors and officers of the corporation from individual liability for the payment of principal and interest of bonds.*—Provisions like this arise mainly from two causes: First, in the original promotion of many enterprises property which is of an uncertain value is, under a contract, turned over to a corporation, sometimes accompanied with a money payment and sometimes without; sometimes in an undeveloped condition and sometimes in a developed condition, for a given number of bonds and a given amount of stock, all of which are issued as fully paid, and then the bonds and

stock are put upon the market by the party making the proposition. If the enterprise turns out successful, no question arises, but if, as is not infrequent, the enterprise is a failure, and the property mortgaged will not sell for sufficient to pay the outstanding bonds, then the bondholder (who is frequently an innocent person) looks to see if he cannot hold the original promoters, the stockholders, directors, and officers in some way, for any deficiency. To guard against being so held, recitals of the character suggested are frequently put in the bonds.

A second reason for such a recital arises from the double statutory liability provided for in some of the states. The constitution of some states provides that all stockholders shall be liable for an additional amount up to the amount of the holding of their stock to pay the indebtedness of the corporation. Most states have no such provision, but wherever such provisions do exist they make trouble and give rise to a considerable amount of litigation. Such litigation it is sought to escape by a contract provision in the bond or mortgage.

No._____ United States of America. State of Ohio. $1,000.

The Columbus Consolidated Street Railroad Company

First Mortgage Twenty Year Five Per Cent. Gold Bond

For Value Received, The Columbus Consolidated Street Railroad Company, a corporation organized and existing under the Laws of the State of Ohio and operating street railroads in the City of Columbus, promises to pay to the Central Trust Company of New York, Trustee, or to the bearer or registered owner hereof, One Thousand Dollars, in gold coin of the United States of America, of the present standard, on the first day of July, 1909, and to pay interest thereon at the rate of five per cent per annum from the first day of July, 1889, on the first days of January and July in each year, on the presentation and surrender of the coupons hereto annexed as they severally become due, until said principal sum shall be paid, both principal and interest of this bond being payable at the agency of said Railroad Company in the City of New York. This bond is subject to redemption on or after July 1, 1894, at 110 per cent of the par value thereof, with accrued interest, out of a sinking fund of $22,500 a year, beginning with that date, as provided in the mortgage herein described. This bond is one of a series of Eight Hundred bonds, of like tenor, date, and amount, numbered consecutively from One to Eight Hundred, both inclusive, and amounting in the aggregate to Eight Hundred Thousand Dollars, which are all equally secured by a mortgage of said Railroad Company in the nature of a conveyance in trust, dated July 1, 1889, and duly recorded, conveying all the property and franchises of said Railroad Company to said Trust Company, in trust, for the benefit of the holders of said bonds, to all the provisions of which mortgage this bond is subject. In case of default for six months after due demand in payment of any interest on any of said bonds, the principal of all thereof may be declared due, as provided in said mortgage. The principal of this bond may be registered on the books of said Railroad Company at its said agency, and registration thereof noted hereon, after which no transfer thereof shall be valid, except on said books, until after registered transfer to bearer, when the principal of the bond will again become transferable by delivery. The coupons annexed to this bond will always be transferable by delivery. This bond shall not be valid unless authenticated by the Certificate of the trustee of said mortgage.

In Witness Whereof, said Railroad Company has caused its corporate seal to be hereto affixed, and this bond to be subscribed by its President and Secretary, and the name of its Treasurer to be engraved on the several coupons hereto annexed, at the City of Columbus, in the State of Ohio, this first day of July in the year Eighteen Hundred and Eighty-nine.

.....*Secretary* .....*President*

[*Title, on back*]

No..... The Columbus Consolidated Street Railroad Company First Mortgage $1000 Twenty Year Five per cent. Gold Bond. Due July 1, 1909. Interest payable January 1 and July 1. Principal and Interest payable at agency of the Company in the City of New York.

[*On the back*]

TRUSTEES' CERTIFICATE.—The Central Trust Company of New York, Trustee, hereby certifies that this bond is one of the series of Eight Hundred mortgage bonds described in the mortgage mentioned herein, bearing date the first day of July, 1889.

CENTRAL TRUST COMPANY OF NEW YORK, Trustee

By.....*Vice-President*

NOTICE!—No writing on this Bond, except by an officer of the Company.

DATE OF REGISTRY	IN WHOSE NAME REGISTERED	TRANSFER AGENT

[On the end, forty Coupons, numbered on the back, and dated each first day of January and July, from 1890 to 1909, the face of the first one reading:]

$25. Coupon No. 1.—On the first day of January, 1890, The Columbus Consolidated Street Railroad Company will pay the bearer, at its agency in the City of New York, Twenty-five Dollars, being the semi-annual interest then due on its First Mortgage Bond No.....

E. K. STENORF, *Treasurer*

18. POLICIES CONCERNING THE KIND AND AMOUNT OF SECURITIES[1]

[The kinds of securities issued by a corporation will ordinarily be a compromise between the kind the company would like to offer and the kind investors would like to have. Be sure you get from this reading an appreciation of the part played by amount and stability of income.]

The next question to consider is: What issues of securities or credit instruments should a corporation put out and what proportion of its total funds should be obtained by each of these issues? In order to raise funds from each of the four sources outside the business itself named above the corporation manager will offer:

Sources	*Securities*
(*a*) To trade creditors	Bills and notes payable
(*b*) To banks	Notes payable and endorsed notes receivable
(*c*) To the investing public	Mortgage bonds and perhaps preferred stock
(*d*) To the speculative public	Stock

The amount of each security offered will depend in part on the assets and in part on the earnings of the corporation.

Corporate assets in nearly every line of business fall naturally into six groups, as follows:

(*a*) Fixed investments essential to the business, such as real estate, buildings and machinery, and in the case of holding companies, securities of subsidiary corporations.

(*b*) Property that could be sold without breaking up the business, though the sale would probably be at a heavy sacrifice, such as, outlying real estate, securities of other companies control of which is not essential to the integrity of the corporation, raw materials, and goods in progress.

(*c*) Finished products on hand.

(*d*) Accounts receivable.

(*e*) Cash.

(*f*) Intangible assets, such as good-will, trade mark, etc.

[1] Adapted by permission from W. H. Lough, *Corporation Finance*, pp. 122–32. (Alexander Hamilton Institute, 1916.)

To the first five groups roughly correspond obligations for borrowed money, as follows:

(*a*) Mortgages and mortgage bonds obtainable as a rule on good terms up to 60 to 75 per cent of the appraised value of real estate; 50 per cent of buildings; 25 to 40 per cent of machinery; 50 to 90 per cent of securities.

(*b*) and (*c*) Income, profit-sharing and car-trust bonds, on a great variety of terms, preferred stock in some cases and to some extent short-term notes and bank loans.

(*d*) and (*e*) Accounts payable and bank loans.

Group (*f*) and the differences between the other assets and their corresponding liabilities are usually represented by stock issues and by surpluses. The reader will understand, no doubt, that this classification is merely approximate and is not always followed in practice; yet an analysis of balance sheets will reveal, on the whole, a close adherence by corporation managers to the principles just stated.

The stability and amount of the earnings will, of course, greatly affect—in fact, determine largely—the value of a corporation's assets, and in that way will affect the amount and kind of securities that it may wisely issue.

Now we take up the long-time obligations—especially mortgages and mortgage bonds—of corporations. Evidently they must be based on permanent, or fixed assets, and in amount will correspond roughly to the value of such assets.

Here we meet with the difficult and important question, What determines the value of fixed assets? Most people would be inclined to say that the cost of the assets must determine their value. A moment's reflection, however, shows this statement to be untrue. Suppose, for instance, that a man has put up a plant at an expense of $100,000 for refining copper, and afterwards discovers that there is no copper within hauling distance. The plant would not be worth the expense of demolishing it. Evidently cost of construction would have very little to do with the value of such assets.

The second opinion is that the value of fixed assets is determined by the expense of duplicating them. It is claimed, for instance, that to arrive at a fair valuation of the railroad property of the United States, all we need to do is to figure how much it would cost to reproduce this property under present conditions. The illustration already used, however, would apply in criticism of this second opinion as well.

The third opinion is that the value of fixed assets is determined by their earning power as in the above illustration. It takes no argument to show that this is actually the case in ordinary business practice. If you were going to buy anything in the nature of a fixed asset, from a university education to a steel mill, your first question as a business man would be, How much will this asset earn for me? Similarly, an investor in buying the securities of a corporation will inquire as to the value of the corporation's fixed assets, and will naturally estimate their value on the basis of earnings—not the present earnings altogether, but probable future earnings as well.

Bear in mind that this principle that earnings determine value is applicable only to fixed assets. The selling value is applicable only to fixed assets. The selling value of floating assets, such as raw material, tools, finished goods on hand, is another matter. That will be determined, normally, as the science of economics explains, by cost of production. The difference arises from the fact that fixed assets—land, buildings, machinery—are not intended for sale, but for use. They generally have little or no value except for the purpose for which they were intended; and their value for their purpose can be determined only by their earning power.

We have already intimated without going into details that the amount of investors' securities which may be issued by any corporation depends both on the value of its fixed assets and on the amount of its income available for interest charges. There is no contradiction between these two considerations. At bottom the important factor on which to base bond issues of a going concern is the amount and stability of income.

See also p. 433. The Meaning of Capital and Capitalization.
p. 492. Short Term Loans and Trade Credit.
p. 643. Chapter vii. Administration of Risk-Bearing.

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19. SOME POLICIES WITH RESPECT TO PREFERRED STOCK[1]

[Since the problem most frequently arising with respect to stock issues is concerning the wisdom of issuing preferred stock, this selection serves to open up a range of "policy questions" concerning stock

[1] Adapted by permission from W. H. Lough, *Corporation Finance*, pp. 77–79 (Alexander Hamilton Institute, 1916.)

issues. The student should be able to work out for himself rough answers to these questions: Under what circumstances should the manager issue cumulative preferred stock? Under what circumstances non-cumulative preferred stock?]

Preferred stock had its origin in railroad reorganizations. In reorganization after bankruptcy it is necessary to cut down the claims of the various bond issues outstanding in order to put the reorganized corporation in a reasonably safe condition. The interest on the first mortgage bonds is usually scaled; some of the junior issues are perhaps turned into income bonds, and in the seventies some bright mind conceived the idea of changing the inferior bond issues into preferred stock. [See page 465, Corporate Reorganization Policies.]

Although preferred stock was originally the offspring of receiverships, it proved to be such a useful instrument for some purposes that it has been retained and is now much used, especially by industrial companies. The railroad companies are gradually giving it up.

Apart from its usefulness already alluded to in cases of reorganization, preferred stock serves four other purposes. First, it may be a convenient means of separating a company's stock into different voting classes. Sometimes the preferred stock has no vote at all; sometimes it elects a limited number of directors. either case the owners of the majority of the common stock may elect a majority of the board of directors. Therefore, a much smaller interest will control the business than would be necessary if all the stock issued voted alike.

Second, preferred stock is often very useful in forming industrial consolidations. As we shall see in the study of these consolidations, they usually capitalized for a great deal more than the combined capitalization of their subsidiary companies. Ordinarily the extra capitalization, which represents prospects, takes the form of common stock, and the present value of the plants and businesses absorbed is represented by bonds and preferred stock. The subsidiary company stockholders are much more inclined to exchange their common stock for preferred stock in the consolidation than they would be to exchange for common stock. If the subsidiary businesses have been successful and profitable it is reasonable to expect that dividends on the preferred stock can be paid, whereas nobody can foresee whether common dividends will be paid or not.

The third purpose of preferred stock is to facilitate the incorporation of a business which has been conducted as a partnership.

In a partnership each partner has as much say with regard to affairs as any other partner, irrespective of the extent of his interest. It is true that in practice the senior partner usually controls, but in law they are all on the same footing. They may desire to preserve the same arrangement in the corporation, in which case they may create a non-voting common stock and assign that stock to each partner in proportion to his interest in the partnership and in addition may make a voting preferred stock, of which each partner receives an equal amount. In this case it is possible that the so-called preferred stock may have preference in nothing except voting power.

Fourth, preferred stock obviously may attract conservative investors who would not care to buy the more speculative common stock of a corporation. Preferred stock, in point of security, ranks between the lower grades of bonds, which are described in succeeding chapters, and common stock. The preferred stock of industrial corporations, on account of their fluctuating earnings, usually sells at much better prices than the common stock of the same corporations, even though the common stock may receive on the average as large or larger dividends.

Sometimes a certain amount of stock will be set aside at the organization of a corporation and given voting power, which right is denied to all the other stock. In such a case the corporation has in existence two classes of stock, "voting" and "non-voting." This is not at all a common arrangement and is rarely, if ever, adopted except when a partnership business is put into the corporate form. It amounts to the same thing as creating preferred stock with the preference confined to the privilege of voting.

20. POLICIES WITH RESPECT TO OPEN AND CLOSED MORTGAGES[1]

[Although the holder of bonds is primarily interested in the amount and steadiness of the income of the company whose bonds he holds, he has, in the case of mortgage bonds, a strong secondary interest in the character and amount of the property put in pledge. This selection gives a glimpse of how this pledging of property may be handled. The material in the latter half of the selection has

[1] Adapted by permission from W. H. Walker, *Corporation Finance*, pp. 118–20. (Alexander Hamilton Institute, 1917.)

further value in that it also shows how steps may be taken to safeguard the safety of bonds which have behind them no specific pledge of property. Remember that when a manager decides to issue bonds with any of the safeguards mentioned, his act reflects a financial policy.

When a corporation is growing rapidly, and needs constantly to enlarge its capital by borrowing, the fact that its best assets are subject to the lien of a mortgage may render it difficult to borrow further on favorable terms. This is particularly true when the presence of the above clause prevents the new extensions or improvements themselves from being pledged under a new mortgage to secure additional funds. It is therefore customary, in railroad finance, and occasionally with other companies, either to provide a bond reserve or to execute an open mortgage, under which additional bonds may, from time to time, be issued to meet new capital requirements.

When the property is valuable enough to sustain a mortgage beyond the immediate amount required, the company frequently mortgages the whole property and authorizes upon this security, an issue of bonds much larger than is immediately needed. These unissued bonds, available for sale at any time for new capital, or for pledge as collateral for temporary loans, constitute bond reserve for financing future extensions.

When, however, the property is not adequate to create a satisfactory bond reserve, or future extensions are contemplated beyond the amount of such reserve, and cannot be financed on separate mortgage because of the after-acquired property clause, it is customary to issue an open mortgage. A closed mortgage is one under which a fixed amount of bonds may be issued and which carries no lien protection beyond that amount. An open mortgage is one which does not fix in advance the exact extent of the lien or the amount of the bonds that may be issued under it.

The open mortgage always restricts the bonds issued under it by requiring the maintenance of an adequate margin of safety the value of the property above the par value of the bonds outstanding. The trustee is instructed not to permit the issue of additional bonds, unless this margin of safety is maintained, and certain definite requirements are imposed to insure this being done. The following are the more customary safeguards, and usually several of them are found in the trust deed:

(*a*) Investment of the entire proceeds from the sale of bonds in the productive property or equipment covered by the mortgage, or to retire maturing prior liens thereon.

(*b*) No additional bonds to be issued while the floating debt exceeds a certain amount or a certain proportion of the total liabilities.

(*c*) No additional bonds to be issued unless the earnings available for fixed charges have averaged for a certain period of time a certain excess above the interest requirements, including interest upon the contemplated new issue.

(*d*) New bonds not to be issued above a certain maximum amount, or a certain amount each year.

(*e*) No property to be sold without turning in to the trustee the full proceeds, or a certain portion thereof, to offset the reduced security, or to retire a portion of the bonds.

(*f*) Maintenance of adequate reserves against depreciation, usually upon some stated basis.

Open mortgages are rare. A bond reserve serves all the purposes of a limited open-end mortgage, and stands in better favor at the present time. Both require rigid restrictions of similar nature. The after-acquired property clause is now the general rule, especially in the large refunding mortgage issues of American railways, which are showing a strong tendency to clear away the numerous small underlying mortgages and provide ample bond reserves. It is clear that the bond reserve plan, especially if property is not adequate to secure the entire authorized issue in the beginning, must carefully restrict floating indebtedness, depreciation of the mortgaged property, and the investment of new funds in non-producing assets.

21. AMORTIZATION POLICIES AND PRACTICES[1]

The security of a loan may consist of the market value of a product, structure, or natural resource, or of the earning power of a business. The bonding value of property of any kind is based upon its productive capacity, or "Value in use." An asset is worth only what it will produce. If, in the course of production, the value of the specific security declines, it becomes necessary that the bonded debt be retired at least as rapidly as the assets upon which it rests are consumed. Such assets are known as wasting assets. Any

[1] Adapted by permission from W. H. Walker, *Corporation Finance*, pp. 179–81. (Alexander Hamilton Institute, 1917.)

natural resource or stock of goods which is exhausted in the course of business is a wasting asset.

Any specific structure or piece of equipment is a wasting asset, because deterioration caused by time or use, or both, is inevitable. On the other hand, a given lot of equipment which is being constantly replaced and improved so that its productive value as a whole is maintained, may not be considered as a wasting asset.

The basis of amortization is therefore found in the nature of the security pledged, by allocating the causes of the wasting values. These causes are three in number:

a) Depreciation in earning power, caused by time or operation.

b) Reduction of assets by sales.

c) Decline in value owing to changes in the market.

Resulting from the nature of these causes, there are two bases of amortization:

a) Upon the unit of time—debt amortized at a certain rate per year, or other unit of time.

b) Upon the unit of production or sale—debt amortized at the rate of so much per ton of coal mined, per thousand feet of timber cut, per acre of ground sold, etc.

To illustrate.—Bonds upon specific railroad equipment or single steamships usually mature serially, and are paid off in perhaps ten even annual payments, because time is the chief cause of their deterioration. Coal bonds are retired out of a fund accumulated at the rate of from three to five cents per ton mined, because production, which reduces quantity on hand, is the factor determining the diminution of the security.

Failure to observe these underlying principles and to distinguish clearly between them has resulted in numerous unsuitable, and often unsuccessful, provisions for amortizing bonds. It should be observed that the first and third causes, above mentioned, possess a sufficient element of uncertainty to produce wide divergence of opinion. The rate of obsolescence, or market decline, is purely speculative in most cases. Frequent errors of judgment in the rate of amortization, therefore, often result, even when the governing principles are clearly recognized.

Sometimes borrowers are hampered by arbitrary sinking-fund demands on the part of investors, who lacking faith in the future of the business, seek rapid amortization as a protection. The protection that they should actually have, in such cases, is often not

amortization at all, but an intelligent policy governing capital investments, maintenance, surplus and dividends. Bonds should never be amortized without good reason, but when amortization is necessary its true principles should be recognized and applied.

The desirability of any given plan of amortization may be tested by the following five considerations:

a) Adequacy of the sinking fund or redemption payment.

b) Certainty of payments.

c) Reasonableness of the distribution of the burden upon the corporation.

d) Effect of the plan upon the market for the bond.

e) Expense and labor involved in the plan.

It will be noted that the first two are for the protection of the creditors, and that the last three are important to the borrowing corporation. The creditor is interested in knowing that the plan is enforceable, the payments certain, and that the amortization provisions are ample to protect him against any decline in the value of the security. The borrowing corporation is interested in securing a just, gradual, and perhaps even distribution of its payments, so that it may be able to make them out of income without distress. The company also desires a plan which will involve as little inconvenience, uncertainty, and expense as possible, and which will enable it to market the issue to the best advantage.

The methods of amortization may be summarized as follows:

a) Retirement in series or by allotment.

1. Bonds maturing serially.
2. Periodical retirement by purchase in open market.
3. Periodical retirement by allotment and advertisement.

b) Redemption fund accumulated against maturity.

1. Fund held by trustee in bank.
2. Funds invested by the trustee in outside securities.
3. Funds invested by the trustee in bonds of the same issue, which are kept alive in the fund.

It is a good policy for a corporation to borrow, and for the same reason it is a good policy not to amortize the loan under any plan unless it is demanded by investors or by the nature of the risk. If the profit of the business of the value of assets is enduring enough to justify the expectation that the protection of the bondholders will remain constant or increase, it is usually unwise to provide for amortization. Serial repayment is a clumsy device, not frequently

used when it can be avoided. Amortization by redemption fund is more frequent.

See also p. 501. The Meaning of Depreciation.
p. 506. Reserves and Other Uses of the Surplus.
p. 854. Chapter x. Analysis of a Business Case.

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22. CORPORATE REORGANIZATION POLICIES[1]

[This selection is written with particular reference to corporate reorganizations in the railroad field. In principle, however, its application is general. It should be read not only to secure descriptive facts concerning reorganizations, but also with the mind searching for principles of financial administration in times of financial embarrassment.]

The term "reorganization" is used in this study to denote the exchange of new securities for the principal of outstanding, unmatured, general mortgage bonds, or for at least 50 per cent of the unmatured junior mortgages of any company, or for the whole of the capital stock. These exchanges have been the essential features of the operations which have been described. This exchange of securities must take place upon a considerable scale.

The exchange of new securities for old on a large scale usually takes place when a railroad is unable to meet maturing obligations. But though impending insolvency is the usual occasion it is not the only one. Reorganization sometimes occurs when prosperity is too great as well as when it is too little. Or a management may desire to get rid of hampering restriction, or it may desire to manipulate conditions of control. This last named cause—the desire to manipulate conditions of control—has been fortunately an infrequent cause of reorganization.

When bankruptcy has at last occurred, three groups of interests take part in the reorganization which must ensue. These are the creditors, who find interest and perhaps principal of their bonds in default; the stockholders; and the bankers and financiers who advance ready money and subscribe to necessary guarantees. Of these the creditors and the stockholders are widely scattered, and are

[1] Adapted by permission from Stuart Daggett, *Railroad Reorganization*, pp. 335–86. (Harvard Economic Studies, Vol. IV, 1908.)

quite unable to protect themselves by individual action. Their first impulse is, therefore, either to elect committees to represent them, or to authorize self-appointed committees of well-known men to look after their interests. Stockholders in a reorganization have little voice. They are the owners, and all that the corporation has is subject first to the bondholders from whom it has borrowed money.

The creditors, then, are the most important factors, and they, like the stockholders, act through committees. There may be a committee for every class of bonds, or one or more classes may join together. The more general a committee, the greater the influence which it seems able to exert on reorganization, and the greater the likelihood that the plan which it approves may be accepted. The fact that a scheme has to meet the criticism of opposing interests during its formation renders it less likely to contain any injustice which conditions make it possible to avoid; and the endorsement of their representatives makes all classes of bondholders more ready to accord it temperate consideration.

The situation which bankers and financiers occupy in relation to a bankrupt road is almost equally important. Their aid is essential to a reorganization while that of the officers and receivers of the company is not. And they are not subject to the pressure of imminent financial loss which forces creditors and stockholders to accept plans of which they do not altogether approve. It is true that these bankers may have money invested in the securities of the road. It may even happen that they have been formerly in control. In this case a certain pressure does exist. But as bankers their function is to do one or both of two things; namely, to advance cash to keep the railroad system together pending reorganization, and to underwrite assessments or the sale of securities. Either one of these involves them in new risks, and in undertaking either they will be only indirectly affected by investments which they may previously have made. Their influence on reorganization is strong because they are necessary, and because they are free to participate or not to participate according to their opinion of the precise reorganization plan proposed. For much the same reason their influence is a wholesome one. *The primary conflict which takes place in any reorganization is between the interests of the corporation which needs a lessening of its burdens, and the interests of the securityholders which is opposed to any reduction in their claims.* The degree to which the former interest prevails determines the strength of the reorganized company. In

this conflict the bankers naturally take the side of the company. As bankers, who advance cash, and who usually receive their pay in securities, they wish to make the corporation prosperous, and to raise the quotations of its securities to a high figure. An important factor also is that as reputable banking firms they wish the future career of corporations which they have handled to reflect credit upon themselves.

At the beginning of the ordinary reorganization, then, creditors, stockholders, syndicate, and corporation find themselves face to face. The interests of the syndicate and of the corporation most nearly coincide except in so far as the syndicate is an owner of stocks or bonds. The syndicate desires a radical reorganization,—the corporation requires it. But as between stock and bondholders and the corporation; between the stockholders and bondholders; or between the junior and the senior bondholders; there is well-nigh complete antagonism. The corporation, to repeat, needs a reduction in the fixed charges which it has to pay. The securityholders wish to lose as little as possible. The stockholders hope to force sacrifices from the bondholders, and the bondholders to levy a heavy assessment upon the stock. The junior bondholders call upon their seniors to bear their part; and the seniors reply that they are well secured and that the juniors and the stock must take care of themselves.

The first question which arises is that of the cash requirements. How much cash must be raised to pay off the floating debt, and how much working cash capital will the new corporation require? It is almost always true that a large floating debt has accumulated prior to reorganization.

In general there are two ways by which cash for floating debt and working capital can be raised: (1) By assessment on securityholders. (2) By the sale of securities.

Sales of securities may comprise the sale of securities of the bankrupt, or of other corporations held in that company's treasury, or they may be sales of part of new bond or stock issues reserved for that purpose.

The case of an assessment is very different. Securities may be sold to outsiders or to present securityholders. In the one event no pressure at all can be brought to bear; in the other only that of the indirect loss which the difficulties of the reorganizing company would involve. An assessment, on the other hand, is levied solely on securityholders and is compulsory. Stockholders or bondholders

who refuse to pay are ordinarily debarred from all participation in the reorganization, and lose all chance to recoup their losses from their share in subsequent prosperity. In return for the assessment some security is usually given, so that from one point of view an assessment and a sale resemble each other.

The results of the discussion may be briefly summed up as follows:

First. Reorganization is most frequently an attempt to extricate an embarrassed company from its difficulties.

Second. These difficulties can generally be traced either to an unrestricted freedom of capitalization, or to destructive competition.

Third. The shape in which trouble appears is likely to be that of a large floating debt or of excessive fixed charges; either or both of which may have brought the corporation to a critical condition sometime before the actual collapse.

Fourth. The best practice favors the retirement of floating debt by assessments on securityholders, though sales of securities are sometimes resorted to, or a combination of sales and assessments is employed.

Fifth. Fixed charges are composed chiefly of interest and rentals. Interest payments are reduced by the retirement of outstanding bonds, by new bonds which bear a lower rate of interest, or by income bonds or stock, or by a combination of securities with a fixed rate of interest with securities upon which payment of interest is optional. Rentals may be reduced by direct negotiation, or the leased roads may be absorbed into the main system, and their securityholders receive new stocks and bonds as above.

Sixth. The new bonds are of fewer kinds and have longer terms to run than the bonds which they displace.

Seventh. This reduction in fixed charges imposes a loss on the greater part of securityholders, both in respect to the annual interest which they can claim, and in respect to the selling price of their holdings. A similar loss is suffered by those securityholders who pay the required assessment.

Eighth. The loss falls on securityholders according to the seniority of their holdings—those bonds escaping which can expect to satisfy their claims from the selling price of the railroad at foreclosure sale.

Ninth. The most important development in reorganization practice has been the increasing use of new securities bearing a fixed

rate of interest with new securities bearing a conditional rate of interest; a use which may make the losses of junior securityholders temporary instead of permanent, and yet safeguard the interests of the corporation. In this connection preferred stock has gained in popularity over income bonds.

Tenth. This development, and the issue of new securities for floating debt and for other purposes, have caused the capitalization after reorganization in all but one of the cases which we have examined to exceed the capitalization before.

Eleventh. In order to perfect a reorganization additional provisions are often inserted, which protect junior securityholders against the reckless issue of new bonds, supply the corporation with ability to make necessary betterments from capital account, protect the corporation from sudden changes in control, and similarly supplement the main clauses.

See also p. 450. Recitals in Bonds.
p. 854. Chapter x. Analysis of a Business Case.
[A reorganization in anticipation of a prospering enlarged business.]

D. Financial Policies and Frequently Used Devices

The preceding section dealt with the financial policies and technical devices which the manager calls into use rather infrequently when he is bringing about some relatively permanent change in the capital used in the business. We turn now to day-to-day operations, devices, and policies.

Any compehensive treatment of day-to-day financial operations would take us far beyond the scope of this present course. We must, therefore, again use a sampling method. We begin (Selections 23–26) by getting some idea of the technical devices in this field which are of service to the financial manager. Here we take as our samples two important accounting records—the balance sheet and the profit-and-loss statement—and the more usual commercial credit instruments, such as the promissory note, the trade acceptance, and the bill of exchange. The use of these commercial credit instruments will be so readily understood that little need be said concerning them. The accounting records call for a word of comment.

We have not at this time the slightest interest either in "good accounting form" or in correct accounting terminology. We wish to

understand the balance sheet and the profit-and-loss statement not as ends in themselves but as means to ends. If we can reach an understanding of these financial statements or reports, (*a*) we can see how they are of service to the financial manager in presenting data which will aid him in arriving at business judgments, and (*b*) we can get a clearer view of the consequences of financial acts or policies, because the consequences are always reflected in these financial statements. An ability to read understandingly a balance sheet contributes not a little to one's ability to understand financial policies and the consequences of financial acts.

Turning from technical devices, we take up (Selections 27–29) the story of short-time advances to a business, giving particular attention to the attitude of bankers and trade creditors.

We then try to understand (Selections 30–32) what becomes of the gross earnings of a business. In large part this matter explains itself, but there are some points which require discussion. Below there is given an ordinary form of the income statement of a corporation. By glancing down through it one can readily sense the issues that arise, one after another, in the disposition of gross earnings. Those items which come up for discussion in Selections 30–32 are put in italics.

a) Gross earnings from operation or manufacture

b) Deduct operating or manufacturing expenses, including *repairs*, *renewals*, and *depreciation* and the result is the

c) Net earnings from operation or manufacture

d) Add income from other sources and the result is the

e) Total income

f) Deduct taxes and we have the

g) Balance applicable to fixed charges

h) Deduct interest

i) Deduct rentals

j) Deduct *sinking fund* and other charges, such as *special reserves*, and we have the

k) Balance applicable to dividends and surplus

l) Deduct *dividends* and we have the

m) *Surplus* from the year's operations

The section closes with an interesting bit of case material (Selection 33), showing how one important firm handled its finances during a period of depression. It is particularly interesting in that it shows so clearly the interdependence of business relationships. There is no

such thing as financial policy separate and distinct from marketing policy, production policy, or personnel policy, to cite only a few of the more important relationships.

PROBLEMS

1. A new corporation has just been formed. The stockholders pay cash at face value for 1,000 shares of stock at $100 per share. Give the balance sheet.
2. The corporation, through its officers, buys land for $8,000, erects a factory at a cost of $15,000, puts in equipment at a cost of $20,000. Give the balance sheet. Would many accounts be summarized to get the figures for this balance sheet?
3. A corporation, in seeking trade credit, gave the following statement to the firm from which it sought the credit.

Assets What the Business Has				Liabilities What the Business "Owes"			
Cash	5	421	16	Notes Payable	55	000	..
Bills Receivable (Net)	3	619	40	Accounts Payable	11	216	41
Accounts Receivable (Net)	94	248	03				
Merchandise	63	934	19	Bonded Debt			
Land	10	000	..	Mortgages	15	000	..
Buildings	32	400	..	Accrued Liabilities	8	925	27
Machinery-Fixtures	71	926	03	TOTAL	90	141	68
				Capital Stock Outstanding	150	000	..
				Surplus-Profits	28	901	14
				Reserves	12	505	99
TOTAL	281	548	81	TOTAL	281	548	81

a) Is this a balance sheet or a profit and loss statement?

b) Set up any division you please in surplus and undivided profits. What, to your thinking, is the difference between the two?

c) Try to have this company declare and pay a 10 per cent cash dividend.

d) Instead, declare a 10 per cent scrip dividend. How will the statement stand? Do not trouble yourself about accounting terminology in answering this. Have the account tell the truth in your own language.

e) Carry $5,000 undivided profits to surplus and $1,000 to reserve against storms.

f) A fire destroys $1,500 worth of uninsured merchandise. Show effect upon the statement.

g) Sell $10,000 merchandise getting $6,000 in cash. How do you account for the other $4,000?

h) If this concern needs funds, why does it not "use some of the surplus," say, by selling part of it?

i) The concern suddenly decides it has "good-will" to the amount of $15,000. Have this appear in the statement. Do not trouble yourself whether this is good accounting practice.

j) Can one judge the success or lack of success of a business house by the cash bank balance it shows at the end of the fiscal year?

k) What is meant by saying that financial policies are reflected in the accounts?

4. What are some of the subclasses of current assets? Why and when is it expedient to have several classes shown on the balance sheet?
5. What are some of the subclasses of liabilities? Why and when is it expedient to have several classes shown on the balance sheet?
6. What parties are interested in the balance sheet of corporations? Why are they interested?
7. "It may be said that a balance sheet is a cross-section of a business showing how it stands at a particular moment of time." What does the profit and loss statement show? The budget?
8. "It is well for the reader to bear in mind at this point that a balance sheet is only an expression of opinion regarding the financial condition of a business at a given time." Explain.
9. Study Selection 24 B, making certain you know the meaning of the terms used and *how* loss and gain is arrived at.
10. What is meant by book credits? checks? promissory notes? drafts? bills of exchange? acceptances?
11. "The open accounts receivable of a manufacturer or wholesaler are looked upon as a much better and more liquid asset than the accounts receivable of a retailer." Why?
12. "The objects and advantages of requiring promissory notes from purchasers are numerous. First, the note is the best evidence of the debt. Second, the note definitely settles the amount due from the buyer to the seller. Third, the note is an effective aid in compelling prompt payment of the account. Fourth, a promissory note is more readily transferable and salable than a book account. Nevertheless, the use of book-account credit is far more extensive than the use of promissory notes." Why is book-account credit more extensively used?
13. "It is not always good business policy for a company to take as much trade credit as it can get." Why not?
14. "The reader must avoid any impression that one merchant may look to the one who handles the goods earlier in the chain for all the capital or credit needed in the conduct of his business." Is this true?
15. "Who, then, suffers by the retailer's improvident credit granting? First, of course, the retailer himself. Second, the honest consumer. Third, the manufacturer, jobber, and other distributors." Explain.

16. If you were making a short-time loan to a retail merchant what items on the balance sheet would be of particular interest to you?
17. Compare the value of mercantile agencies, local credit men's associations, and the financial statements of the firm itself as to the reliability of their information as a basis for (1) extending credit; (2) investing in the business.
18. Study the reading "What a Bank Wishes to Know before Making a Loan" to see whether you understand why it is worth while to call for each item.
19. Some banks wish an industrial engineer to study a factory before making a loan. Why?
20. "Enough has been said to indicate the true purpose and safe extent of short-term borrowing, whether from trade credit, bank loans, or the sale of short-term obligations to the public. (*a*) To produce, ship, store, sell and collect for the regular product of the business, when there is reasonable certainty of turning the transaction in time to repay the loan. (*b*) For current or capital expenditures pending the receipt of funds from the sale of stock or bonds which have been underwritten, and the proceeds of which are expected in time to liquidate the temporary loan. (*c*) To carry unusual seasonal stocks, production, or accounts receivable which will ordinarily be liquidated in time to repay the loan or amply secure its partial renewal. (*d*) To pay dividends which have been earned but are temporarily locked up in assets that will be normally liquidated in time to repay the loan." Cite instances of each case.
21. How may a merchant borrow on his accounts receivable? Is it expedient to do so?
22. "Actual surplus is usually created out of net earnings from operation. Fictitious surplus may be created by a stroke of the accountant's pen, simply by writing up the value of assets or charging maintenance items to inventory accounts." Illustrate.
23. What is a surplus? From what sources may it be obtained? For what purposes is it usually accumulated?
24. "Book surplus is distributed by (*a*) cash dividends; (*b*) scrip dividends; (*c*) stock dividends; (*d*) the creation of special reserves; (*e*) charging off a certain amount to make good, losses which have impaired capital, or to squeeze the water out of original over-capitalization." Be sure you know the meaning and method of each way.
25. "Whether or not all or part of the surplus should be distributed in the form of dividends will require careful consideration of many factors. Summarized they are as follows:
    a) Can the business safely reduce its liquid assets by the amount necessary to pay the dividends?

b) Is the margin between selling price and cost decreasing to such an extent as to threaten the profits enjoyed in the past?

c) Have all expenditures for capital accounts been justified and have they been bona fide expenditures?

d) What is the company's credit position and its ability to raise needed sums for expansion through the issue of capital stock or bonds?

e) Is the investment market favorable?

f) Can the profits safely stand increased fixed charges or increased amounts for dividend distribution?"

Explain each item.

26. Explain what is meant by (*a*) depreciation, (*b*) replacement, (*c*) betterment, (*d*) extension. What confusion is likely to result in charging these items to their respective accounts?

27. "In a general sense depreciation means a decrease in value; appreciation on increases. Decrease in value may be caused by:

a) Deterioration in physical condition, due to use or corrosion.

b) Obsolescence.

c) Changing business conditions, due to either new legislation or fluctuating market demands.

d) Unavoidable accident, or destruction by act of Providence."

Should these be charged to capital account or to current expenses?

28. The XYZ company contemplates for the coming year the following expenditures: (*a*) a slate roof to replace an iron roof on one of its main buildings; (*b*) an extension of its fabricating plant to house several new machines; (*c*) erection of a building to serve as a recreation room and lunch counter for employees; (*d*) to replace a wooden warehouse, which cost originally $40,000, with a re-inforced concrete building, expected to cost $70,000; (*e*) to buy a trade-mark for $100,000. The finance committee proposes to finance these purchases by an issue of twenty-year bonds. The slate roof is expected to cost $2,500, against $1,000 for the iron roof. Extension $50,000, and the employees' building $35,000. Discuss the wisdom of this proposal.

29. What would happen if a corporation paid dividends annually without making allowance for depreciation, replacement, and repairs? Would the original price of the stock return to the stockholders? Would there necessarily be a loss to them?

30. What is a stock dividend? A scrip dividend? What are the advantages of such forms of dividend payment? Are they advantages to the stockholder?

31. "Scrip dividends really partake of the nature of a forced loan." Why or why not?

32. Discuss the policy of paying dividends where (*a*) losses in fixed capital have occurred; (*b*) where losses in circulating capital have been sustained.

33. "It is often assumed that adequate and regular profits, provided they are correctly estimated, justify dividends. This assumption, however, is the direct source of a large proportion of financial embarrassments." Why?
34. What are the advantages of a stable dividend policy? By what methods may a stable dividend rate be maintained in spite of fluctuating earnings?
35. What are the chief characteristics of a sound dividend policy?
36. Under what conditions or circumstances are the directors of a corporation justified in borrowing the money with which to pay dividends?
37. What is meant by saying that a concern may be economically sound but in financial straits?
38. A concern decided that it needed to invest an additional $15,000 in machinery. Cite possible ways of getting the funds. Show effects of each way upon the balance sheet.
39. Could a small concern have used the methods sketched in Selection 33?

23. WHAT THE BALANCE SHEET SHOWS ABOUT FINANCIAL MATTERS[1]

[This selection is written from the point of view of an auditor. His statements concerning what "should" be done or what is "right" may, however, be regarded not as discussions of good accounting practice, but of sound financial policy.]

The credit man of today, whether he be commercial banker, investment banker, manufacturer, or merchant, in seeking information as to the financial standing of a concern has many avenues from which he can obtain data. The mercantile agencies with their investigations and reports; the credit clearing houses; the local credit men's associations; the opinion of those with whom the concern has done business in the past; all of these are available. These sources are, however, indirect and are all based largely upon hearsay and opinion. They may be satisfactory enough in indicating the general reputation of a concern; but to determine its present financial standing they are not only inadequate but are dangerous and obsolete as compared with the concern's own financial statement—provided, of course, that this statement is true, properly prepared and verified.

These financial statements are technically known as the *balance sheet* and the *profit and loss statement.* A balance sheet is a statement showing on one side all of the assets of a concern as of a certain

[1] Adapted from Paul Havener, *Analysis of Financial Statements.* (Privately printed.)

date and on the other side all of the liabilities. Custom in this country places the assets on the left-hand side and the liabilities on the right-hand side. The difference between the assets and the liabilities, if the assets exceed the liabilities, is the net worth. In the case of corporations, this net worth will consist of capital stock, surplus, and undivided profits. In partnerships, the net worth will be the capital accounts of the partners, together with any undivided profits. If the liabilities exceed the assets, there is no net worth or capital belonging to the owners left, and the difference represents the amount that the concern is insolvent. The left-hand side of the balance sheet shows what property the business has and the right-hand side shows to whom this property belongs. The profit and loss statement is an analysis of the operations of the business for a certain period of time, showing the total income and the expenses and losses during the period. It may be said that a balance sheet is a cross-section of a business, showing how it stands at a particular moment of time. The profit and loss statement shows how it arrived at this position from a previous one.

The assets of a business are of two distinct types—fixed assets and current assets. Both of these can be further divided, but to keep these two kinds of assets always separate is one of the most important things in reading a balance sheet. Fixed assets, also known as permanent assets, invested assets, etc., are those which represent capital sunk into the business that cannot be converted into cash except upon the liquidation of the business. They are usually such assets as land, buildings, machinery, equipment, furniture and fixtures, patent rights, good-will, etc. These assets are not in the regular course of business convertible into cash, and therefore cannot be used to pay the current liabilities of the business. Current assets, also known as liquid assets, floating assets, quick assets, working assets, represent cash and such other assets as in the regular course of business will be cash: such as accounts receivable, notes receivable, merchandise on hand, etc. All past due or doubtful current assets should be called slow assets. The purpose of most businesses is to convert current assets into cash as soon as possible.

The liabilities of a business are also of two types, but the distinction is not so great as in the case of the assets. The fixed liabilities are obligations which do not mature for several years. They are usually secured by mortgage on the fixed assets, such as mortgage notes, bonds, purchase money obligations, etc. Current liabilities,

sometimes called quick liabilities, floating debts, etc., are liabilities which will have to be paid in cash within a short period of time, such as accounts payable, notes payable, pay-rolls, etc.

We have before us the balance sheet of A, B and Company, which is as follows:

BALANCE SHEET—A, B & CO.

As of June 30, 1916

ASSETS		
Fixed:		
Land and buildings, etc.	$ 50,000.00	
Machinery and equipment	75,000.00	
Horses, wagons, etc.	5,000.00	
		$130,000.00
Slow:		
Accounts past due	$ 10,000.00	
Due from officials	20,000.00	
		$ 30,000.00
Current:		
Cash on hand	$ 21,000.00	
Notes receivable	2,000.00	
Accounts receivable	175,000.00	
Inventories	75,000.00	
		$273,000.00
Deferred:		
Prepaid insurance and licenses		$ 600.00
TOTAL ASSETS		$433,600.00
LIABILITIES		
Current:		
Accounts payable	$ 40,000.00	
Notes payable	60,000.00	
TOTAL LIABILITIES		$100,000.00
NET WORTH		$333,600.00
Consisting of:		
Capital stock	$200,000.00	
Surplus	83,660.00	
Profit per year	50,000.00	
		$333,600.00

The difference between the total assets and the total liabilities of any business, as previously mentioned, is the net worth. An analysis of the different classes of assets and liabilities will show clearly where this net worth is invested.

With the balance sheet as a whole visualized before us, let us dissect each item therein.

Fixed assets.—The first item of the fixed assets consists of land and buildings. On this particular item we ask the following questions: Are there any liens or mortgages against the real estate and buildings? Is the land at cost? Is the building at cost less a reasonable allowance for depreciation? Does the concern own the land and buildings? Frequently a concern will have mortgages or purchase money obligations on this item and only show same on the balance sheet at a net value, that is, the value of same after deducting the liens thereon. This is wrong. These liens or mortgages may fall due within a short period of time, seriously upsetting the relation existing between the current assets and current liabilities. Again, there is the question of the basis of value. Occasionally concerns, during a bad year's business, revalue their real estate by charging same with arbitrary amounts and crediting profit and loss. Real estate, which is a general term including both land and buildings, should be valued at the original cost in the case of land, and cost less reasonable allowance for depreciation in the case of buildings. Any liens or mortgages thereon should appear among the liabilities of the company.

The second item in the consideration of fixed assets is usually machinery and equipment. The important thing governing their valuation is depreciation. Depreciation is a general term and covers the gradual diminishing in value of an asset whether by wear and tear or by obsolescence. Many failures of concerns with long-established records, who have paid large dividends and big salaries to their stockholders and employees, may be traced to the failure to provide properly for depreciation on their machinery and equipment. The machinery in a factory can become obsolete over night in this age of modern invention.

All items such as furniture and fixtures, automobiles, wagons, horses and mules should be revalued each year. The rate of depreciation on them varies so much, depending entirely on the use to which they are put, that no fixed rate of depreciation is satisfactory.

Hence, in summarizing, it may be said that tangible fixed assets should appear on the books of the company at cost less full deprecia-

tion. In the case of liens or mortgages thereon, these should be shown among the liabilities and not deducted from the assets. Intangible assets, such as good-will, patent rights, trade-marks, copyrights, franchises and concessions, are not always to be condemned, as in many instances they are assets easily converted into cash. They should always, however, appear on the balance sheet under a separate heading and should not be included with the tangible fixed assets as they now are by many of our largest corporations, desiring to cover up so-called water in the capital stock issued.

Current assets.—The first item of the current assets is usually cash. In more cases than you might suspect, this item is misleading. Banks sometimes ask concerns that are in the habit of overdrawing their accounts to deposit money with them, giving a certificate of deposit therefor. The concern then takes these certificates to other banks and borrows on them to the full amount of the certificates. Cash on hand should consist of money in the cash drawer and of funds in bank subject to check: money in cash drawer should, of course, be comparatively small, except in case of concerns located in places where there are no banks; from the funds in bank should be deducted all unpaid outstanding checks. Pledged certificates of deposit, miscellaneous paid bills, due bills from officials or employees are not cash items and should never be so called.

In this balance sheet notes receivable appear too small in relation to the other assets and should lead to inquiry as to whether or not the concern has rediscounted any of its notes. It is customary for a concern to rediscount its customers' paper and, if same is not paid at maturity, the concern rediscounting has to take it up, so this rediscounted paper is a contingent liability which is liable to become a real one at any moment. The financial statement of a concern should show somewhere the possible liability covering all paper rediscounted. The remaining notes on hand should be due from customers of the company. Notes from officers, employees, and stockholders should be shown under a separate heading in the balance sheet. Past due notes and doubtful notes should be put under a separate heading called "slow assets."

The thing to ask in connection with accounts receivable is how these accounts were created, whether entirely by legitimate transactions of the company or partly by items due from officers, employees, stockholders, or merchandise sent on consignment. If the latter be the case, these items should be eliminated and appear elsewhere in

the balance sheet. Another important matter is to ascertain whether any accounts have been sold to discount companies or assigned for any reason whatsoever. When accounts are sold to discount companies, the credit risk has not been eliminated; the business transaction is not closed, nor has the money been received from the customer.

Inventories.—The important thing to consider in inquiring into the inventories of a company is the quantities, quality, and price at which the inventory was taken, and whether or not there are any liens on any of the inventories or consigned goods included therein. This is probably the easiest part of the balance sheet to state incorrectly, and the only way that you can be sure the inventory appears at the right valuation is to know that it has been thoroughly tested as to quantities, quality, prices, footings, and extensions by disinterested outsiders.

Deferred assets.—Deferred assets consist principally of prepaid insurance and licenses. It is usually a small item except in cases of agricultural corporations, who close their books in the middle of a crop season. In many cases, inventories of supplies and materials should be put under this heading. It simply represents expenses prepaid, of which the following operating period will derive the benefit. In comparison with the other assets of the business, they should be relatively small.

Current liabilities.—In regard to the liabilities of the business, the first item is usually accounts payable. This is an item which is readily manipulated and liable at all times to be understated. In auditing the affairs of a concern it is one of the most difficult items to verify.

Notes payable, like accounts payable, can be easily understated. In the balance sheet or auditor's report it is best that notes payable to banks, to note brokers, and to other creditors be shown separately. An important matter in examining this item is to ascertain whether or not any money has been borrowed by the proprietors or officials in the concern's name and turned over to the business with a credit to the capital account of the proprietor, instead of appearing as a liability of the business.

Liabilities for pay-rolls and taxes, it should be remembered, are first lien on the assets, and in case these items are out of proportion, remember that they will be paid before anything else, perhaps leaving little for the unsecured, common creditors.

Amounts due employees, officers, and relatives may in some cases be properly shown under a heading separate from current liabilities. Nevertheless, it should be distinctly kept before you that, in case of financial difficulties, such accounts usually get paid before any others.

Contingent liabilities and reserves.—Full information should appear somewhere on the financial statement as to all possible contingent liabilities. We have already spoken of notes receivable, rediscounted, and accounts receivable sold. Accommodation endorsements have not infrequently been the cause of the failure of a prosperous business. Full inquiry should be made as to whether there are any such endorsements outstanding, as they may appear at any time and demand payment in full. Inquiry should also be made as to whether there are any suits pending in the courts, or judgments which might make a material difference in the financial position of the concern. With the employees' liability law and other similar measures, it is possible for liabilities of this nature to arise at any time. Outstanding contracts, leases, moneys borrowed from members of family should be looked into as to whether or not they have claims on the business. Special attention should be paid to reserve accounts. Reserve for depreciation should be deducted from the asset which it affects; reserves for taxes, for pay-rolls, and for interest are not reserves, but accrued liabilities, and should show among the current liabilities. Reserve for bad debts, when appearing at a lump sum of say $5,000.00 or $10,000.00, should be closely investigated. Reserves for bad debts should not appear on the liability side of the balance sheet, but be deducted directly from the accounts affected. In some instances, an arbitrary amount set aside like this is not enough to cover the accounts which the proprietors know are worthless. It is only by a detailed inspection of each account individually that the amount necessary can be determined within any degree of accuracy. A reserve for contingencies is usually a part of the capital of the business, consisting of profits temporarily withheld.

Fixed liabilities.—Fixed liabilities, such as long-time bonds, should appear on the balance sheet under a separate heading among the liabilities and not erroneously deducted from the value of the assets against which they are liens. In the case of serial bonds, a certain amount of which fall due each year, the amounts falling due within a year of the date of the balance sheet should be shown as current liabilities and not as fixed ones. Due caution should be

exercised in ascertaining upon just what assets the fixed liabilities, that is, the mortgages and bond issues, are liens. Occasionally they are first lien, not only upon the real estate of the company, but upon all other assets, and this should plainly appear on the statement.

Capital, or net worth.—The important thing in analyzing net worth is first to see how the capital is invested and how it originated. Often the surplus of a concern is not real surplus, but a manipulation of the values of the fixed assets.

24. WHAT THE PROFIT AND LOSS STATEMENT SHOWS

A[1]

The examination of the profit and loss statement is principally a matter of comparison, the object, of course, being to see whether the business is going forward or backward.

Let us now inspect the profit and loss statement of A, B and Company, just as we did their balance sheet.

On page 483 appears the analysis of profit and loss of A, B & Company.

The profit and loss statement is usually divided into sales, less cost of sales, which gives the gross profit, less expenses, which leaves the operating profit, then special deductions and losses are taken off and special additions are added thereon, giving the net income for the year.

Sales.—Comparison should be made with previous periods as to the volume of sales, and, in well-conducted businesses, this should usually show an increase. Inquiry should be made as to whether or not there is included under the heading of sales goods sent out on consignment or goods shipped to subsidiary companies, branches, or agencies. Such items are not sales but part of the inventory until sold. The total sales should be compared with the inventory in order to determine the number of times same has been turned over during the period.

Sales should also be compared with accounts receivable, as this will show how fast accounts are being liquidated, and also, in many instances, bring to light whether any accounts are included in accounts receivable not originating in sale of merchandise. From the total sales should be deducted full allowance for returnable packages, freights, discounts, etc.

[1] Adapted from Paul Havener, *Analysis of Financial Statements.* (Privately printed.)

Cost of goods sold.—The most approved manner of arriving at the cost of goods sold, whether for mercantile or manufacturing concerns, is as follows: To the inventory of the goods on hand at the beginning of the year should be added the purchases of goods made during the year, or raw material plus cost of manufacture in case of manufacturing plants, plus any other direct charges, such as incoming freight, incoming drayage, etc. This gives the total goods to be accounted for. The inventory of goods on hand at the end of the year represents all goods which have not been sold, and is therefore deducted from the "total goods to be accounted for,"

ANALYSIS OF PROFIT & LOSS—A, B & CO.
For Twelve Months Ending June 30, 1916

Sales		$500,000.00
Goods on hand first of year	$ 60,000.00	
Goods purchased during year	415,000.00	
Total to be accounted for	$475,000.00	
Inventory at close of year	75,000.00	
Balance cost of goods sold		$400,000.00
Gross profit		$100,000.00
Expenses:		
Rent	$ 10,000.00	
Salaries	20,000.00	
Taxes	2,000.00	
Interest	4,000.00	
Miscellaneous	11,000.00	
Total expenses		$ 47,000.00
Operating profit for year		$ 53,000.00
Less:		
SPECIAL DEDUCTIONS & LOSSES:		
Bad debts	$ 5,000.00	
Fire loss	8,000.00	
	$ 13,000.00	
Plus:		
SPECIAL ADDITIONS:		
Profit on sale of real estate	$ 10,000.00	$ 3,000.00
Net income for year		$ 50,000.00

Percentages:		
Gross profit	25 % on cost	20 % on sales
Expenses	11.75% on cost	9.4% on sales
Operating profit	13.25% on cost	10.6% on sales
Net profit	12.5 % on cost	10 % on sales

leaving balance as cost of goods sold. This, when deducted from the total sales, gives the gross profit for the period. It is therefore obvious that the amount at which the inventories are valued determines to a great extent the profit for the period.

Expenses.—The expenses of the business should be carefully compared with the previous periods to see whether or not they have increased and whether or not the business is being managed economically. The item of interest should be carefully looked into as compared with the notes and accounts payable, as a check on the total of same outstanding. When miscellaneous expenses are shown at too arge an amount, details should be required. Salaries of officials should be in proportion to the size of the business. When the total expenses are deducted from the gross profit, there then remains the operating profit for the year—from which, however, further deductions must sometimes be made.

Special deductions and losses.—All extraordinary losses, such as bad debts, fire losses, losses through damage suits, should be absorbed during the period in which they are discovered and not charged directly to surplus. When these items are charged directly to surplus, the profit and loss statement does not show the movement of the business from one balance sheet to another as it should. The amount charged off on account of bad debts should receive due consideration as compared with the total sales.

Special additions.—All extraordinary profits, such as profits realized from the sale of capital assets, should appear in the profit and loss statement under this heading, and same should be added to the operating profit for the year, leaving the net income.

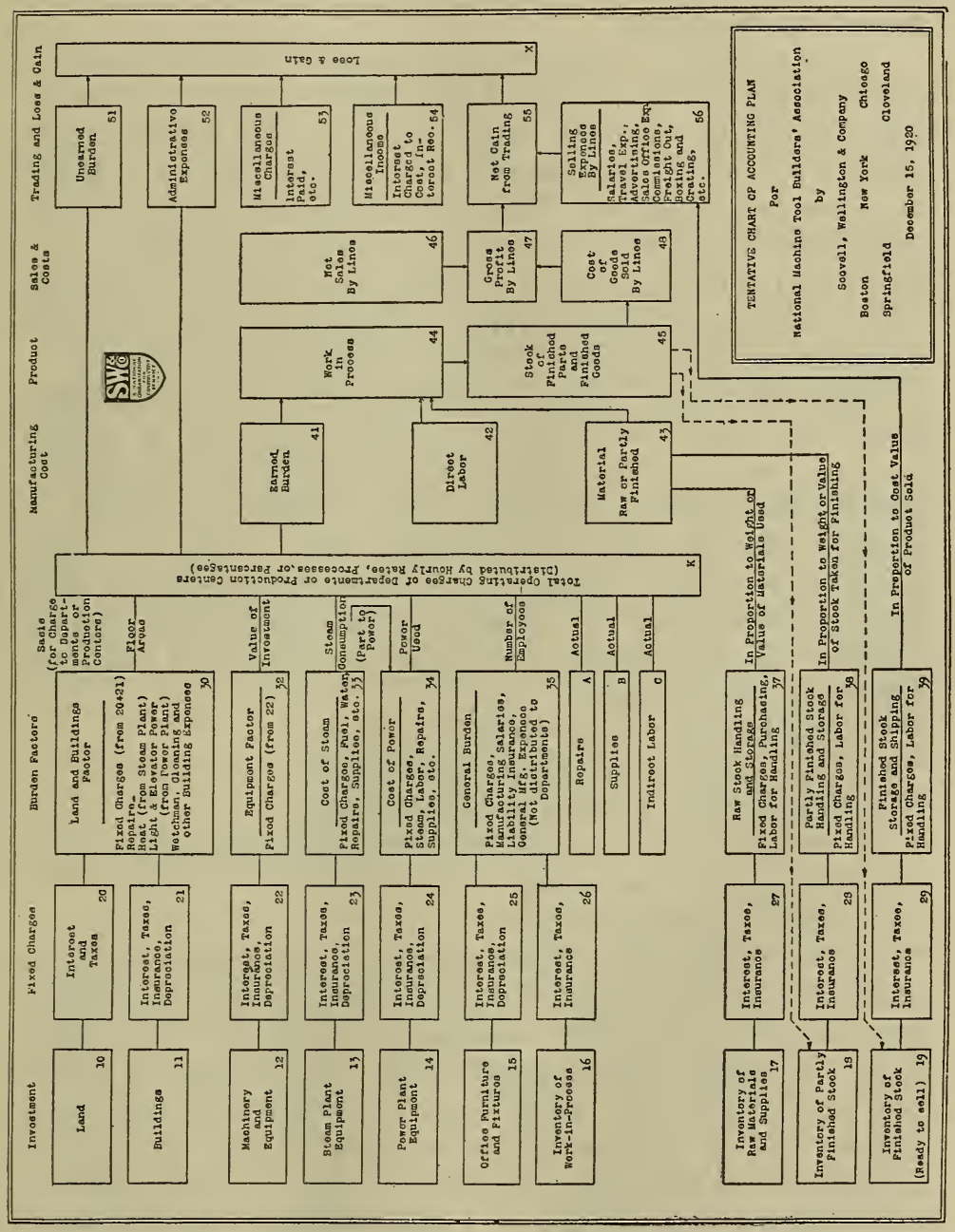
Somewhere in the profit and loss statement should appear a detailed statement of the percentages showing the gross profit based both on cost and on sales. Expenses, operating profit, and net profit should be treated in the same manner. On account of the confusion in the minds of many as to whether percentages should be figured on sales or cost, it is usually best to figure them both ways.

The important thing in connection with the examination of the profit and loss statement is the comparison of same with previous periods and the comparison of same with balance sheet.

See also p. 333. Measuring Aids May Result in Expense Standards.
p. 335. Measuring Aids Reflected in the Profit-and-Loss Statement.

B[1]

[This diagram should be compared with the profit and loss statements on pages 336 and 483. It is drawn to meet the needs of a manufacturing business, whereas they are designed for mercantile businesses. There is no difference in principle.]



[1] By Scovell, Wellington & Company.

25. FINANCIAL POLICIES REFLECTED IN ACCOUNTING RECORDS[1]

Accounting is a matter of policy as well as of principle. That is, judgment must be employed to determine under given circumstances, what principles apply and how they are to be applied. Like all good instruments, accounting principles may be purposely, or ignorantly, abused and misapplied.

To be productive, wealth must be supervised; nor is it possible to remove altogether the element of risk inherent in all forms of enterprise. There is a big human factor in business. For this very reason business is subject to manipulation which may be unfavorable as well as favorable in character. Like the modeling clay of the sculptor, wealth submits itself to an endless variety of formations. It is because of this that we speak of the policy of one company as conservative, of another as radical, of another as aggressive, of still another as progressive or unprogressive. What do we mean by these terms?

Too frequently we employ them without any very definite significance and without more than a superficial inspection, or possibly from mere hearsay. The financial policy of a corporation is unavoidably linked up with its accounting policy. Indeed, it is through its accounts that this policy takes definite form. Usually a policy resembles a chemical compound and can be studied best by being split up into its elements. Some of the elements entering into the formation of the financial policy of a corporation and which are reflected in its accounts are:

1. The attitude toward dividend payments.
2. The method of meeting current liabilities.
3. The method of raising additional capital.
4. The selection of customers and collection of accounts.
5. Payments of employees.
6. The funded indebtedness.

1. Some corporations make it their policy to pay annual dividends of a given amount and vary from that policy only in times of extraordinary prosperity or extreme depression. Usually such corporations have their capital stock scattered among a large number of holders who depend upon it to afford them a permanent and unvarying income. On the other hand there are many concerns that have no crystallized dividend policy, but which act upon the requirements of

[1] Adapted by permission from E. A. Saliers, "Financial Statements Made Plain," in the *Magazine of Wall Street*, Vol. XX (1917).

the occasion. Such companies are hardly for the steady-going investor. Instead of selling bonds or stock to secure additional capital, profits may be retained and invested. In this way the surplus account may be increased until it rivals and possibly surpasses, in size, the capital stock account. Truly, this is conservative policy, yet it is not the kind of policy best suited to the investor who desires to receive his profits as they accrue, rather than in the form of a large stock dividend years later.

The power to pay or withhold a dividend, assuming the existence of profits, is in the hands of the board of directors. Whether or not to declare it is optional with them. Once declared, a dividend becomes the direct obligation of the company and must be paid.

2. Current liabilities constitute a most vital responsibility. They demand the constant vigilance of the management. Sometimes financial embarrassment occurs from the inability to secure enough cash to meet current liabilities, even though the concern be far from insolvency. This situation is liable to arise when general stringency occurs in the money market, it then being difficult to obtain aid through the hypothecation of other assets.

Sometimes current liabilities are converted into funded liabilities to avoid immediate trouble—a procedure which only too frequently paves the way for future trouble. As a palliative against an extraordinary situation this plan may be justifiable, but as a permanent policy it is to be condemned. By comparing balance sheets for a considerable period of years the tendency of current liabilities to increase may be noted; and if it is considerable the explanation therefor should be sought. The only justification for a permanent increase in current liabilities is a corresponding growth in the volume of business transacted. Without this, the cause may be in over-buying or in the inability to meet obligations falling due.

3. The ease with which a corporation can raise additional capital to finance its growing demands is a pretty good index of its general reliability. Strong companies can usually choose what means they wish to encourage the influx of other people's money, but weak ones are driven to extremes to find some suitable form of security. Some of our railroad companies have exhausted their ingenuity and our language in their search for picturesque names for what in plain English ought to be called second, third, and fourth mortgage bonds. In general, new capital ought to be obtained through the issue of sufficient stocks or bonds to secure the required amount of money

without further resort to temporary bank loans, which, under the circumstances, might be made with difficulty.

4. Too much circumspection in the selection of customers is hardly possible, although the importance of this consideration varies greatly in different lines. Where sales of commodities or services are mostly for cash little attention need be given to possible losses from bad debts. Where many sales are made on credit the consideration becomes one of prime importance. An up-to-date concern uses all available facilities to determine credit risks. Employment of mercantile agencies, co-operation with other corporations, and a systematized office practice are among essential features that characterize the work of progressive corporations. The investor will do well to go beyond the statement of accounts receivable shown in the balance sheet and attempt to learn to what extent worthless or doubtful accounts have been included. If the balance sheet has been certified by a firm of competent public accountants their visé may be accepted as a guaranty against occult and disreputable practices.

5. The investor should note the satisfactoriness of the wage system in use. If it is a good one it will be contrived to reward diligence and trustworthiness and to discourage laziness and inefficiency. In the long run no corporation can prosper with a labor force composed of dissatisfied, indifferent, or ignorant men. Managers are now thoroughly convinced that future leaders are best grown in a home soil under surroundings which encourage the display of initiative and force.

6. With the aid of the principles that have been discussed, study the funded indebtedness from all standpoints—from that of the capacity of the corporation to bear fixed charges, from that of the mortgage liens that underlie the bonds, from that of future probable requirements for additional capital, from that of the relative size of bonded indebtedness compared with capital stock and surplus, and from the standpoint of legal and technical requirements.

See also p. 828. Accounting as an Administrative Aid.

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26. TYPES OF COMMERCIAL CREDIT INSTRUMENTS[1]

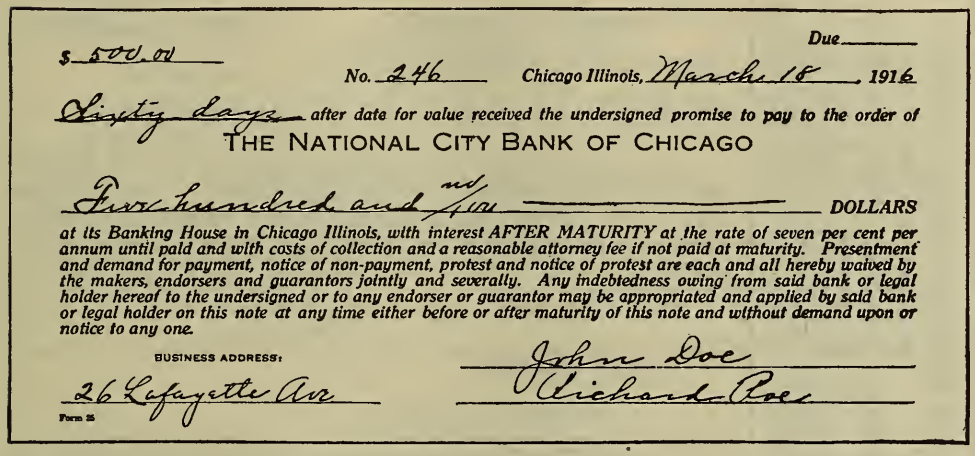
A promissory note is an unconditional written promise by X (the maker) agreeing to pay, either on demand or at a definite future date,

[1] Taken by permission from H. G. Moulton, *Principles of Banking*, pp. 32–35. (The University of Chicago Press, 1916.)

a sum of money to Y (the payee) or to Y's order or to bearer. It may or may not designate the place at which payment is to be made. Promissory notes may be issued by institutions and governments as well as by individuals. Bank notes, United States notes, certificates of deposit, etc., are forms of the promissory note.

To indorse a note the payee writes his name across the back of the instrument. This act makes the payee, like the maker, responsible for the payment of the note. Notes may also be indorsed by third parties,

A PROMISSORY NOTE



$ 500.00 Due

No. 246 Chicago Illinois, March 18, 1916

Sixty days after date for value received the undersigned promise to pay to the order of

THE NATIONAL CITY BANK OF CHICAGO

Five hundred and no/100 DOLLARS

at its Banking House in Chicago Illinois, with interest AFTER MATURITY at the rate of seven per cent per annum until paid and with costs of collection and a reasonable attorney fee if not paid at maturity. Presentment and demand for payment, notice of non-payment, protest and notice of protest are each and all hereby waived by the makers, endorsers and guarantors jointly and severally. Any indebtedness owing from said bank or legal holder hereof to the undersigned or to any endorser or guarantor may be appropriated and applied by said bank or legal holder on this note at any time either before or after maturity of this note and without demand upon or notice to any one.

BUSINESS ADDRESS:

26 Lafayette Ave

John Doe

Richard Roe

Form 25

thereby adding to the number of those responsible for the payment of the note. Notes which show only one person responsible for the payment are called single-name paper. Those which have two or more signers are called double-name or three-name paper.

A bill of exchange is an unconditional written order, signed by X (the person giving the order—the drawer), ordering Z (the drawee) to pay, either on demand or at a definite future date, a sum of money to Y (the payee) or to Y's order or to bearer. The drawee may indicate his willingness to honor it by signing his name to the word "accepted" written across the face of the bill.

Bills of exchange are of two kinds—foreign, and domestic or inland. A foreign bill is legally defined as one the drawer and drawee of which live in different countries or different states, while a domestic bill is one both parties to which live within the same state. Business custom, however, warrants our using the term *domestic bill* for all bills when both parties live in the United States, regardless of state lines.

There is likely to be some confusion as to when to use the term *draft*. Draft and bill of exchange are often used interchangeably.

For instance, we speak of drafts on London and bills of exchange on London, and we say New York exchange and drafts on New York. In the business world, however, there is a growing custom of using the term draft when speaking of domestic transactions, while one frequently hears the term *bill of exchange* in connection with foreign transactions.

TRADE ACCEPTANCE

TRADE ACCEPTANCE
FORM APPROVED BY THE
AMERICAN TRADE ACCEPTANCE COUNCIL
EMBRACING COMMITTEES OF THE
CHAMBER OF COMMERCE OF THE UNITED STATES
AMERICAN BANKERS ASSOCIATION
NATIONAL ASSOCIATION OF CREDIT MEN

_____ 191 No._____
(CITY OF DRAWER) (DATE)

ON_____PAY TO THE ORDER OF
(DATE OF MATURITY)

OURSELVES_____(DOLLARS $_____)

THE OBLIGATION OF THE ACCEPTOR HEREOF ARISES OUT OF THE PURCHASE OF GOODS FROM THE DRAWER. THE DRAWER MAY ACCEPT THIS BILL PAYABLE AT ANY BANK, BANKER OR TRUST COMPANY IN THE UNITED STATES WHICH HE MAY DESIGNATE.

TO_____
(NAME OF DRAWEE)

_____ _____
(STREET ADDRESS) (SIGNATURE OF DRAWER)

_____ BY_____
(CITY OF DRAWEE)

This form usually has stamped across it another form which indicates its acceptance thus:

ACCEPTED

DATE _____

PAYABLE AT _____

LOCATION OF BANK_____

_____
(SIGNATURE OF ACCEPTOR)

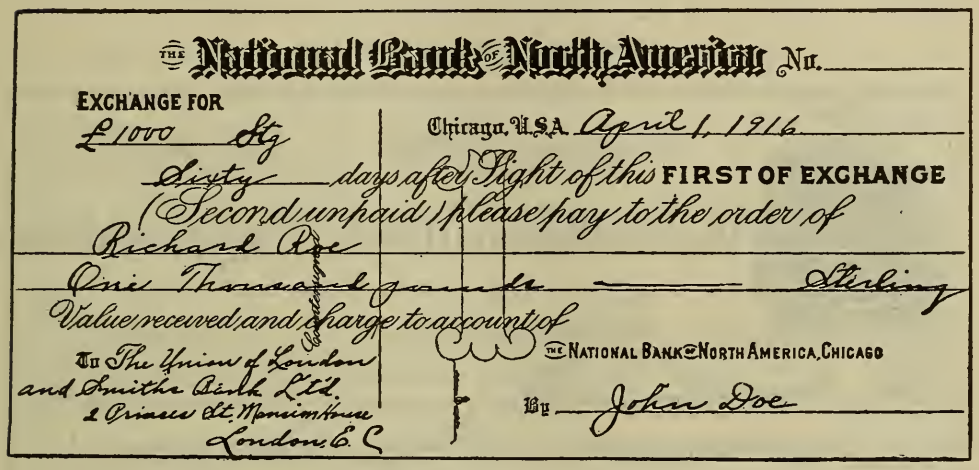
BY_____

Bills of exchange may be classified according to whether or not the parties to the order are bankers. A banker's draft is an order drawn by one bank and payable by another. It is not necessary, however, that the party to whom it is payable be a bank. In the case of individual or trade bills of exchange the payee may be the drawer himself as well as a third party. The payee may also be a bank. The second party, the drawee, may likewise be a bank, in which case the

bill of exchange is in the form of the familiar check drawn by a person against his deposit account in a bank.

Bills may be classified according to whether or not they arise out of actual commercial transactions. Hence we have bankers' or finance bills, trade or commercial bills, and accommodation bills.

A FOREIGN BILL OF EXCHANGE


THE National Bank of North America No. _____

EXCHANGE FOR

£1000 Stg

Chicago, U.S.A. April 1, 1916

Sixty days after Sight of this FIRST OF EXCHANGE

(Second unpaid) please pay to the order of

Richard Roe

One Thousand pounds ——— Sterling

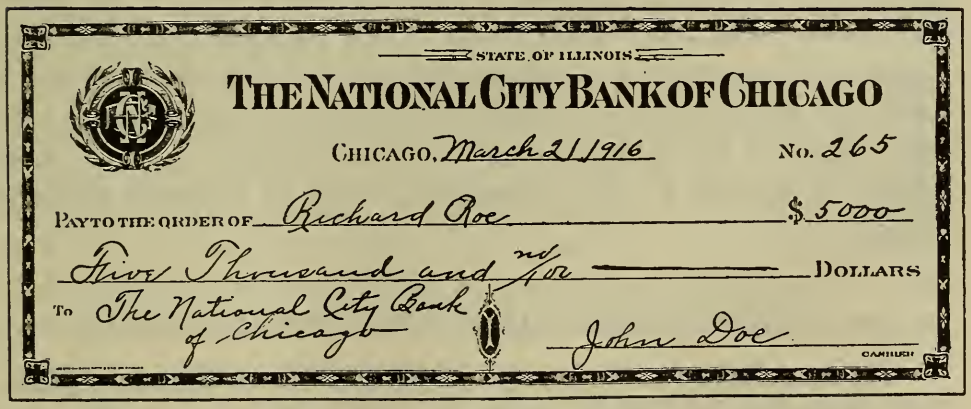
Value received and charge to account of

THE NATIONAL BANK OF NORTH AMERICA, CHICAGO

To The Union of London and Smiths Bank Ltd. 2 Princes St. Mansion House London E. C.

By John Doe

CASHIER'S CHECK


STATE OF ILLINOIS

THE NATIONAL CITY BANK OF CHICAGO

CHICAGO, March 21 1916 No. 265

PAY TO THE ORDER OF Richard Roe $5000

Five Thousand and no/100 ——— DOLLARS

To The National City Bank of Chicago

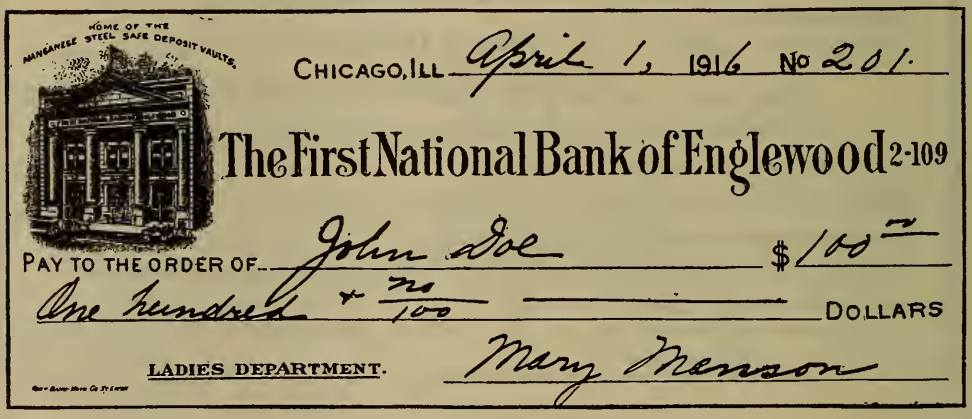
John Doe

CASHIER

Bankers' bills are used merely as a means of making payments and transferring balances and are secured by the reputation of the bank that draws them. A commercial bill arises out of an actual sale of goods, and is secured, not only by the general responsibility of the drawer, but also by the goods which have been exchanged for the purpose of sale. Accommodation bills are bills which do not arise out of any business transaction already concluded, though there may be an intention to purchase goods with the funds procured.

In order to illustrate the use of these instruments, suppose that X has bought a bill of goods from Y. X may pay in one of several ways: (1) He may "pay cash," and this may be in bank notes, United States notes, gold certificates, etc. (2) He may give Y a check on his (X's) bank. (3) He may draw and deliver a bill of exchange on Z payable to Y or Y's order. In such a case Z is presumably a debtor to X. (4) He may give Y a promissory note. This will merely defer actual

PERSONAL BANK CHECK



payment. (5) He may "accept" a bill of exchange which Y has drawn upon him. This also merely defers actual payment. (6) He may transfer to Y some check or promissory note or bill of exchange which some other person (say V) has drawn to X's order or to bearer. (7) He may buy from his banker a banker's draft drawn (on some other banker) in favor of Y. (8) He may buy from his banker a cashier's check.

27. SHORT-TERM LOANS AND TRADE CREDIT[1]

The three forms in which corporations incur short-term or medium-term obligations, are, trade credit, bank loans and notes sold to the public.

The funds raised from the trade creditors are secured simply by buying goods on credit. It is not customary in most lines of business to demand cash immediately on delivery of goods, except from concerns that are considered untrustworthy. Thirty days is usually allowed before merchandise bills become due and payable, and a

[1] Adapted by permission from W. H. Lough, *Corporation Finance*, pp. 133–46. (Alexander Hamilton Institute, 1916.)

company whose business requires it, can often considerably lengthen the average time of settlement in certain lines of business. In some lines—especially when the sales are in large lots—sixty to ninety days, or even six months, are frequently allowed. For ninety days or over the debtor company generally gives a formal promissory note or else accepts a time draft which amounts to the same thing.

It is good business policy for a company to take as much trade credit as it can get on advantageous terms and with safety. These two qualifications are worth elaborating. A company does not obtain trade credit on advantageous terms: (*a*) when by so doing it acquires a reputation for "slow pay" which makes dealers unwilling to quote to the company their lowest prices; (*b*) when by so doing it loses the benefit of cash discounts larger than the prevailing discount on bank loans—provided in this case that the company is not already borrowing as much as it should from banks. A company cannot accept trade credit with safety when by so doing its short-time liabilities are brought up nearly equal to its quick assets. Notice that the relation is not between total liabilities and total assets, but between quick liabilities and quick assets. A concern must have cash funds at hand to meet its accounts and bills payable when due and no other assets, no matter how available, will serve the purpose. A failure to realize just that simple fact has been responsible for many an unnecessary bankruptcy.

We may infer from a study of representative balance sheets that a conservative company will not, as a rule, allow its accounts, bills and notes payable to run much over 75 to 80 per cent of its quick assets. This percentage is, in fact, not far from normal. It would be foolish to try to lay down any absolute rule where so much depends on the custom of each line of business, on the seasons, on the nature of the company's assets, on the ease with which bank credit may be secured, and on the general commercial outlook.

Bank loans are not usually to be had except on first-class security and for short periods. (Discussion omitted, see p. 495.)

Notes sold to the public as a source of funds may be used in order to raise funds from (*a*) concerns which supply merchandise, (*b*) banks or (*c*) the public. We have already seen how and to what extent they may be issued in the first two cases; we have now to consider the third case.

The usual, although not a necessary, distinction between notes given in the ordinary course of trade or to banks and notes sold to

the public is in the length of time of the debt. In the first-named cases they do not usually run over six months. Notes sold to the public are more likely to run from one to ten years. Two or three years is about the average period, intermediate between sixty-days to six-months notes, on the one hand, and ten- to one-hundred-year bonds, on the other hand. They are issued in denominations varying from $100 to as high as $100,000.

The chief objection to these instruments is that they do not appeal to any large dependable body of purchasers. The commercial banks do not care for them because they are not "quick" enough. Comparatively few individual investors will buy them because they are to be cancelled within a comparatively short period, and the average individual investor does not choose to watch his investments closely and renew them frequently. His idea, on the contrary, is to get hold of a safe security that yields a steady return and to keep it indefinitely. The market for medium-term notes, therefore, is restricted, generally speaking, to persons of large means who are in fairly close touch with the financial world and who happen to have idle funds on hand. Such persons are most easily reached through the big financial houses and these houses almost invariably absorb note issues of any size and distribute them to their clients.

On account of the limitations of the market it is always difficult to tell in advance whether an issue of medium-term notes will be taken up by the public or not. It is still more difficult—in fact, impossible—to tell at the time of issue whether the notes can be readily renewed when the time of payment arrives. No conservative corporation manager will put out such notes unless he has first provided for their payment when due. This he may do in two ways; either by saving the necessary amount out of the corporation's income or by securing through bond issues the funds with which to pay off the notes. The first course involves cutting down the borrowings of the corporation which, as has been pointed out, is likely to be undesirable. Ordinarily the second course would be inadvisable, for if bonds are to be put out at all they might as well be issued in the first place.

This suggests the usual reason for the issue of notes to the public, namely, as a temporary expedient when a bond issue is for the time being deferred.

Although notes for the public are generally simply unsecured promises to pay, they may, especially for the longer terms, be on certain definite property. A corporation's holdings of securities

of other companies are frequently put up under a trust agreement as collateral. It is difficult to draw a line between long-time collateral trust notes and short-time collateral trust bonds; in fact notes and bonds merge into each other and the distinction between them is in some cases merely nominal.

28. WHAT A BANK WISHES TO KNOW BEFORE MAKING A LOAN

[The following is a sample of the blanks which banks require the prospective borrower to fill out before making a loan. Notice that the bank can learn many things concerning the soundness of the finances of the concern by studying the relationships of items.]

Name (Corporate Style).....
Home Office..... Business.....
Branches.....

The following is a true statement of the financial condition of this corporation at the close of business on the ..... day of ..... 19... and of all facts hereinafter set forth, made to THE CHASE NATIONAL BANK *of the City of New York*, for the purpose of procuring credit and any other accommodations or benefits which may be requested. For such purposes, the bank may at any time assume that the condition and affairs of the corporation have continued substantially as good as herein set forth until notified by the corporation to the contrary. The corporation agrees to immediately advise the bank of any substantial change in its condition or affairs.

Fill All Blanks, Writing "No" or "None" Where Necessary

STATEMENT OF STOCK

Assets		Liabilities	
Cash on hand		Notes payable to own banks	
Cash in banks		Notes payable for paper sold through brokers	
Due from customers:		Notes payable for merchandise	
On open accounts		Notes payable to others	
On notes receivable		Accounts payable for merchandise purchased	
Trade acceptances receivable		Accounts payable to others	
Due from controlled or allied concerns:		Trade accept's pay	
For merchandise sold		Due to officers, directors, employees, and stockholders	
For advances made		Deposits of money with Company	
Due from officers, directors, employees, and stockholders		Time or demand	
Merchandise:		Accrued expenses	
Finished (how valued)		Mortgage debt	
In process (how valued)		When due	
Raw (how valued)		Interest rate	
Land (valued at cost, mortgages, if any, in liabilities)		Lien on what assets	
Buildings (present value, mortgages, if any, in liabilities)		Bonded debt	
Mchy. and equip. (present value, mortgages, if any, in liabilities)		When due	
Furniture and fixtures		Interest rate	
Stores, supplies, etc.		Lien on what assets	
Deferred charges		Other liabilities (itemize)	
Investment in controlled or allied concerns			
Other bonds, stocks, and investments (valued at cost)		Capital stock, preferred	
Good-will		Capital stock, common	
Patents		Surplus	
Other assets (itemize)		Reserves (itemize)	
Total		Total	

PROFIT AND LOSS ACCOUNT

Total net sales for year, less returns			
Net trading profit (after all expenses, including depreciation, interest, etc.) $			
Other income $			
Total income			
Dividends:			
Amount paid — In cash			
Amount paid — Otherwise disbursed $			
Rate per cent paid in cash on preferred ... On common			
Amount declared (not yet paid) $			
Remainder of earnings carried to surplus			

CONTINGENT ASSETS AND LIABILITIES

Endorsed bills receivable discounted			
Are these included in assets?			
Accounts receivable pledged or assigned			
Are these included in assets?			
Trade acceptances receivable discounted			
Are these included in assets?			
Endorsements for affiliated or other interests			
For guarantees			
Approximate amount of outstanding contracts and commitments, as of statement date, for purchase of merchandise			
TOTAL			

INSURANCE CARRIED BY CORPORATION WITH REGULARLY INCORPORATED AND LICENSED COMPANIES

On merchandise			
On buildings and machinery			
Use and occupancy			
Life, for benefit of business			
Life, in name of			

OTHER BANK ACCOUNTS

Names of Banks	Credit Lines Obtained			On What Basis Is Accommodation Obtained (Endorsements, Receivables, Collateral, etc.)?
Total				

COMMERCIAL LETTERS OF CREDIT

If corporation imports merchandise against confirmed or unconfirmed commercial letters of credit, give total amount of credits outstanding on statement date			
Unmatured drafts drawn against these credits up to statement date			
Unused portion of commercial letters of credit outstanding			

ENDORSEMENTS ON CORPORATION'S NOTES

Names of Endorsers	Responsibility of Endorsers Outside of This Business						
	Personal Assets			Personal Liabilities		Net *Outside* Worth	
Total							

Incorporated under laws of State of ..... Date of charter.....
Incorporated under laws of State of..... Date of charter.....
Expiration of charter.....
Authorized capital, preferred $.....Issued capital, preferred $.....
common $..... common $.....
Amount of stock issued by corporation for cash or property, other than good-will or services, preferred $.....
common $.....
Total maximum indebtedness last year $..... .....Date.....
Minimum indebtedness last year..... $.....Date.....

MERCHANDISE

Are goods shipped to branch houses carried on your books in merchandise account or accounts receivable?.....
Is any of your merchandise on hand held against trust receipts?.....
Give amount on statement date $.....
In what account is merchandise held against trust receipts carried on your books? ..... On statement date did you have on hand any merchandise consigned to you?.....Give amount $.....
Was this consigned merchandise included in merchandise items of statement submitted?.....
Have you established any reserve for fluctuation in value of merchandise?.....
Give amount of such reserve on statement date $.....

Do selling offices or branches borrow locally, or otherwise?.....Give amount so owing on statement date $.....
If selling offices or branches borrow, are their loans included in liabilities of parent concern?.....
Is there anything in by-laws of charter of corporation limiting its borrowing capacity?..... What is limit?.....
Does corporation borrow on collateral?..... What kind of collateral?.....
Give amount so owing on statement date.....
Are there any unsettled claims, or suits pending, against corporation not appearing on books as liabilities?.....Give amount $.....
Are preferred dividends cumulative?.....Give amount in arrears, if any, on statement date $.....
On what basis is depreciation charted on buildings?..... On machinery and equipment?.....
What is appraised value of buildings?.....Of machinery and equipment?.....
Are books regularly audited by public accountants?.....
Give date of last audit.....
Give names of accountants who made last audit.....
If corporation sells commercial paper through brokers, or others, give names of such brokers (or others).....
.....
Give date on which corporation regularly takes inventory and closes books.....
.....

(NOTE.—On the opposite side of this sheet are the names and addresses of the officers and directors.)

29. BORROWING BY ASSIGNMENT OF ACCOUNTS RECEIVABLE[1]

FOR VALUE RECEIVED, we, the undersigned, have bargained, sold, assigned, transferred, and set over and by these presents do sell, assign, transfer and set over unto L. SPIEGELBERG & SONS, their successors and assigns, the claims and accounts more specifically set forth in the statement annexed hereto and made part hereof, which is a copy of the original claims and accounts, assigning, transferring and conveying to the said L. SPIEGELBERG & SONS all our right, title, and interest

[1] Taken by permission from C. W. Gerstenberg, *Materials of Corporation Finance*, pp. 908–9. (Prentice-Hall, 1905.)

in and to the same and in and to the merchandise, the sale of which created said accounts with full power to reclaim said merchandise as heretofore stated.

To have and to hold the same unto L. Spiegelberg & Sons, their successors and assigns, and we hereby constitute and appoint said L. Spiegelberg & Sons our true and lawful attorneys irrevocably in our name or otherwise but to their own use and benefit to collect and receive all moneys due or to grow due upon said accounts and to collect, sell, assign, transfer, set over, compromise, or discharge the whole or any part of said accounts and to receive, reclaim, and without notice to us, dispose of the merchandise, the sale of which created said accounts (in the event that for any reason said merchandise in whole or in part shall come back upon said accounts) and for those purposes do all acts and things necessary or proper in the premises. This assignment is made for due and valuable considerations, having been paid to the undersigned by L. Spiegelberg & Sons and also is made in furtherance of an agreement about to be made between the undersigned and L. Spiegelberg & Sons and as further collateral security for the payment of any indebtedness arising as a result of said agreement and otherwise.

We hereby guarantee payment of said account at maturity and hereby represent that the accounts so assigned are just and true and are the result of bona fide sales and that the merchandise, the sale of which created the accounts hereby assigned, belonged to us solely and absolutely and was not in whole or in part consigned to us and that the debtors therein named have agreed to accept the same; that no payment has been made on said accounts; that there are no set-offs or counterclaims thereto and that the terms of credit are as specified and that any and all remittances on said accounts coming direct to us shall be received by us in trust for L. Spiegelberg & Sons only and that the identical remittance in whatever form it may be received by us shall be immediately handed over to L. Spiegelberg & Sons and that all deductions on said accounts will be made good by us to L. Spiegelberg & Sons by payment of the same in cash or by payment of the same out of any balance to our credit in the hands of L. Spiegelberg & Sons, if any, and should the purchasers reject, return, or refuse to accept any or all of the merchandise mentioned in said accounts that we will immediately give notice thereof to L. Spiegelberg & Sons and it shall then be optional with L. Spiegelberg & Sons to surrender to us the said merchandise refused, rejected, or

returned upon receiving payment thereof in cash or if they so elect, to deduct from any balance which they may have on hand or out of any sum which they may thereafter have on hand to credit the amount of said merchandise.

The said representations are made to induce Messrs. L. SPIEGELBERG & SONS to make advances to us on the faith of the said accounts herein assigned by us.

The said account so assigned by us shall in the event of the undersigned making an agreement with Messrs. L. SPIEGELBERG & SONS for further advances on other merchandise become part of the accounts under said contract and shall be treated in the same manner as provided for in said contract.

IN WITNESS WHEREOF COMPANY has hereunto set its hand and seal this day of December, 1910.

L. S.

By.....

See also p. 413. Note Brokers, Commercial Paper, Commercial Credit and Discount Companies.

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30. THE MEANING OF DEPRECIATION[1]

[The following discussion of the meaning of depreciation in the railroad business gives a hint of some of the difficulties involved in figuring depreciation in any complex industry. It is one of the difficult financial problems which confront the manager of such a business.]

Does depreciation mean the loss of value in a car or an engine due to wear and tear? If so, this sort of depreciation is amply covered by proper maintenance; in other words, it is usual when an engine or car goes into the repair shop, whether damaged in an accident or by legitimate wear, to replace its worn-out or damaged parts and restore it to its original condition. Repairs are classed as "running repairs," by which are meant the repairs necessary to keep equipment in safe running condition; and "general repairs," by which are meant the repairs needed to restore the equipment to its original condition. There are plenty of cases on roads both in this country

[1] Adapted by permission from F. A. Delano, "The Application of a Depreciation Charge in Railway Accounting," *Journal of Political Economy*, XVI (1908), 586–90.

and in Europe, where locomotives and cars are so well maintained that there is no appreciable depreciation. Indeed, locomotives are running on English roads which are, though obsolete in many respects, as good as new, though fifty years old; and there are many cases upon roads in this country where engines and cars twenty-five years old have been so well maintained that they are as good as when originally built.

In respect to buildings and other structures, their ultimate life depends entirely upon the character of maintenance and care. Wooden buildings well roofed and painted, repaired when necessary, will last indefinitely, and of course, structures of masonry or iron are even more permanent. Buildings and structures on railroads are rarely discarded except because they have outlived their usefulness, and something of a more efficient type is needed in their place.

DIAGRAM I

Curve illustrating condition of equipment, buildings, or structures over a long period of time. Space along vertical lines represents value of equipment, etc. Space along horizontal lines represents time interval.

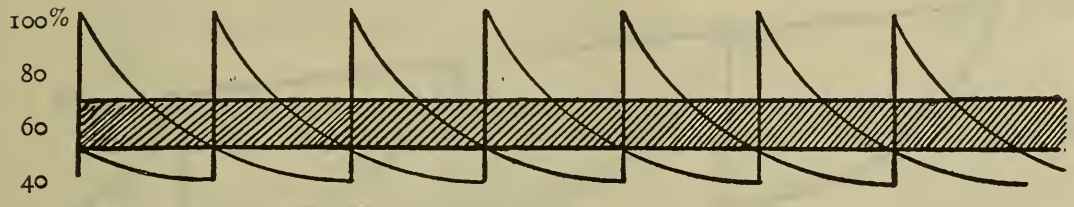
From the foregoing it will be seen that if by depreciation is meant the loss due to wear and tear, it may be illustrated as to each piece of equipment or each building or structure, by a mathematical curve something like that indicated in the accompanying Diagram I. The distance from "A" to "B" represents the period of time in which under normal conditions the deterioration takes place; in the case of locomotives, say three years; in the case of passenger cars, say two years; in the case of freight cars, a very variable quantity, averaging perhaps three years; in the case of buildings and structures, depending wholly on the character of the building and structure, climatic conditions, etc. The distance from "A" to "C" represents the diminution in value due to wear and tear down to the point where it becomes necessary to make extensive repairs. This is one view of what is meant by depreciation.

Another view of depreciation is that it represents the amount by which the average condition of the physical property has deteriorated

below the original or new condition. It is assumed that each piece of physical property on the railroad, other than the real estate, is depreciating in value in the way represented by the curve already drawn, but that because the railroad is a composite of an immense number of units, the average condition of all the separate units combined is represented by a line at some point between the upper and lower nodes of this curve. Obviously, this will vary a little bit on the different roads according to the personal equation of management, local conditions, etc., which in turn are affected by good or bad business conditions. A corporation differs from an individual only in degree. In good times, expenditures for maintenance are liberally made: in hard times all expenditures of this kind which can be safely postponed necessarily cease. If then by depreciation is meant the

DIAGRAM II

The result of composite curves similar to those shown below is a line or more strictly a band or zone representing *average* condition



drop for the original cost down to the average-condition value of equipment, buildings or structures, it is evident that there is a line, or more accurately, a band or zone somewhere between 100 per cent value and the 50 per cent value, and this band, speaking very liberally, will be somewhere between 60 per cent and 75 per cent of the original cost. It is obvious, however, that when the lower limit of this band which represents the average condition of the units is reached, depreciation does not continue farther, and that therefore if a regular fixed charge is to be made to cover this alleged loss of value the charge should cease at that point as the limit of actual depreciation of the units considered as a whole has been reached.

Still a third view of depreciation is that it means the depreciation due to "obsolescence." It is argued that while each piece of equipment or every building or structure may be restored to its original condition, there is a diminution in value, due to obsolescence. Every manufacturer, as well as every corporation, fully appreciates this. In a country which is developing rapidly it is frequently necessary to discard perfectly good equipment, buildings, and structures, and to

replace them with something more efficient. It is possible that conditions will warrant "writing off" the cost of such equipment or structures and charging to cost of operation the entire cost of renewal with more modern and more efficient tools or equipment. It may be argued that this is the kind of depreciation which it is the business of the railroad to provide for by monthly charge in its operation. The difficulty is to estimate the rate at which such depreciation takes place.

To illustrate it, we may represent such a depreciation as this by a mathematical curve for each piece of equipment, building and structure, as shown in Diagram III. The difference between the curve in Diagram III and that of Diagram I lies in the fact that Diagram III

DIAGRAM III

Diagram showing condition of equipment, buildings, and structures as in Diagram I, but taking into account depreciation due to obsolescence

RATE OF DEPRECIATION DUE TO OBSOLESCENCE

shows a depreciation due to obsolescence, whereas Diagram I does not. In III we make a line "A—D," which is at a slight angle to the horizontal. It represents the *rate of depreciation* due to obsolescence. It contemplates that every time a unit of equipment, a building or a structure, is restored to a condition "as good as new," it is not brought back to a value equal to that represented by its original cost, but to a value as much less than its original cost as the depreciation due to obsolescence may have brought it. To provide for this sort of depreciation it is obviously necessary to determine the rate of depreciation due to obsolescence. Who shall say? Shall we be guided in the future from the results in the past? Shall we say in respect to locomotives that because locomotives are now as high, as wide, and perhaps as long as they may be built, there can be no further developments in that direction? Or, shall we accept the arguments of those who believe in electric transportation, that the steam locomotive will soon be discarded and the electrically driven motor take its place?

In one case, the rate of depreciation due to obsolescence will be small, while in the other case, it can be determined only by our surmise as to how soon the revolution from steam to electricity is going to take place.

31. THE SOURCES OF THE SURPLUS[1]

[This selection and the following one should be read not merely to learn descriptive facts concerning the surplus but to see financial policies being reflected in the surplus.]

One possible, though very unusual, means by which a corporation obtains a surplus is by inheritance. Take, for instance, a corporation which is a consolidation of two companies, each having a surplus of its own. The consolidation may conceivably simply guarantee the bonds and other outstanding debts of the subsidiary companies, may issue dollar for dollar in stock for the stock of the subsidiary companies and may transfer the former surpluses bodily to its own accounts. We may dismiss this first possible source of surplus, then, with the statement that it is too uncommon to be worth much discussion.

The second source of surplus, which also is rather unusual, is the selling of the corporate stock or bonds above par. Evidently the corporation in such a case receives a sum of money greater in amount than the obligations which it incurs. Now this extra sum may be handled by an accountant in three or four different ways. One way is to include it in the corporation's surplus account. The propriety of this method may be disputed, but this is an accounting rather than a financial question.

A surplus may originate, in the third place, in whole or in part from the sale of a corporation's fixed or semi-fixed assets. Thus if a manufacturing company owns a plant which has become obsolete and worthless for manufacturing purposes, and the value of which has been fully covered by a depreciation reserve—in other words, written off the books—and afterwards sells this plant, the sum resulting would go into the surplus account. Of course, the reader will understand that if the value of the plant in such a case had not been written off the books, but was still included in the corporation's balance sheet, the only effect of its sale would be a transfer of the amount received from the property account to cash or notes receivable or whatever was taken in payment for the plant.

[1] Adapted by permission from W. H. Lough, *Corporation Finance*, pp. 374–76. (Alexander Hamilton Institute, 1916.)

A similar source of surplus is a revaluation of the fixed assets of a corporation when the revaluation shows an increase in their value. This increase would naturally be represented on the liability side of the balance sheet by a corresponding gain in the surplus. Generally speaking—and it must be remembered that there are some exceptions to this rule—an upward revaluation of assets is not in accordance with correct accounting or financial principles. Therefore, this fourth source of surplus is not commonly found.

This brings us to the fifth and most common source of surplus, namely, saving from income. The uses to which income should be put after the fixed charges and reserves had been provided for, are found to be dividends and surplus. It will do no harm to reiterate the important principle that the dividends of practically every corporation should be maintained at a fixed rate and should move only to increase. Fluctuating dividends destroy the confidence of the investing public and greatly reduce the credit of the corporation below what it might possess. The proper policy, with few exceptions, is to ascertain the minimum net earnings of a company in the years of greatest depreciation and rigidly hold the dividends at or below that minimum. The rest of the net earnings will be transferred to the company's surplus account.

32. RESERVES AND OTHER USES OF THE SURPLUS[1]

"A surplus," says Henry R. Hatfield, "by whatever name it may be called, represents additional capital (normally derived from profits), the purposes for which it is created may be any of those for which capital is needed, or it may be used, as profits ordinarily are used, to provide means for paying dividends." Generally speaking, whether the surplus be hidden or shown on the face of the balance sheet, the proper purposes for which the surplus may be set aside by the board of trustees are the following: (1) to protect the corporate estate; (2) to improve the *esprit de corps* and increase the efficiency of the personnel of the service; (3) to increase the business of the corporation without increasing issues of share or credit capital; (4) to reduce the funded debt; and (5) to equalize dividends.

At the discretion of the board of directors, the surplus may be utilized to protect the corporate estate against impairment, through a series of continued operating losses. One method of accomplishing

[1] Adapted by permission from F. A. Cleveland and F. W. Powell, *Railroad Finance*, pp. 168–76. (D. Appleton and Company, 1912.)

this end is to retain for the use of the corporation a margin of undivided profits to insure against losses which may be due to fluctuations in the volume of business, the net result of which might be to decrease the corporate estate.

A second purpose for which a fund or reserve may be created out of surplus is to insure against casualties, such as fire, storm, flood, and accident, where insufficient provision has previously been made through current charges against revenue. In establishing the policy of the corporation and in managing its affairs, the board must decide whether the corporation will incur an expense in the nature of premiums paid to other companies for carrying such risks or carry the risk itself.

A third purpose for which surplus may be distributed is to create a fund to recoup losses from bad debts or to serve as a reserve to protect the company against the infidelity of officers and employees. The reasons for the company's carrying its own credit and fidelity insurance are practically the same as those above set forth for carrying its own insurance against casualties. The margin of saving, however, is very much larger, since the percentage of actual loss to the corporation from bad debts and from infidelity is relatively small compared with premiums which would be paid. This also may be accomplished by setting aside a part of the surplus.

A further provision may be made in like manner for protection of the corporate estate against depreciation due to failure to maintain the property against wear and tear and waste from the elements. In similar manner, provision may be made for losses or deterioration due to obsolescence of type of equipment or the expiration of patents or other rights. While ordinarily such a fund would be created and maintained as a charge in the nature of current expense, and as such would be a deduction from earnings, failure to make ample provision for such protection in the past may suggest to the board the advantage of direct appropriation from surplus.

Still another form of reserve is to be found in amounts set aside to protect the corporation against loss due to speculation in its securities, or to protect it against a temporary impairment of its credit. Usually this function is performed without a definite fund having been provided or appropriated. It is not an uncommon practice for a corporation's officers to watch the market in order that the price of its securities may not be unusually or harmfully depressed by traders who may seek to obtain advantage from a "raid." In some jurisdictions

it is made unlawful for a company to trade in its own securities; in such event it would be unlawful to appropriate or set aside a fund to protect its securities against speculative or other trading.

The use of the surplus for the purpose of improving the *esprit de corps* or for increasing the efficiency of the personnel of the corporation takes several forms. Amounts may be set aside as a fund to indemnify employees for time lost and personal expense caused by illness, injuries, etc. The advantage of so doing is apparent. The sympathy and interest of employees is a valuable asset of the corporation. It not only tends to increase working efficiency, but it also enables the corporation to deal with employees on a more favorable wage basis. To the same end, funds may be provided or set aside as a pension fund. This may be done through an appropriation from surplus or through a direct charge against income. In like manner appropriations may be made for education, recreation, and social improvement of employees. Thus appropriations are made to local branches of Christian associations; social centers are established and maintained for the employees of a particular corporation; and contributions may be made to social organization and entertainment centers which are established and maintained for the benefit of several railroads.

More frequently than for other purposes the surplus is used to increase the business of the corporation without increasing its outstanding shares or bonded debt. To this end surplus may be appropriated for extensions into new territory for improving the facilities for doing business, for improving the road, for acquiring new equipment for use within territory already occupied, for constructing or acquiring enlarged terminal facilities, or for acquiring properties and equipment which may be used in collateral enterprises such as steamboats, mines, quarries, and timber. Assuming that added properties or equipment are desirable, the board has before it the option of deciding whether new securities will be issued or a portion of the surplus applied to such use.

Surplus may be set aside to increase the working capital of the corporation; for the purpose of increasing the cash, stores, and other assets available for handling the current business, or for increasing credit accounts of customers. Seldom, however, is this accomplished through a definite appropriation or funding measure, but usually, when the surplus is not hidden, through carrying the amounts as undivided profits or in the general surplus account.

A further use of surplus for increasing the business of the corporation is found in actions taken to purchase the securities of other corporations. This is one of the most effective methods of establishing connections and obtaining more effective working relations with other lines.

Many considerations may be present which would move a board of directors to appropriate or set aside funds for the reduction of the funded debt. Common among these is the contractual obligation established at the time bonds are issued, creating a sinking fund. Under such contracts, it is usually made obligatory to set aside a definite amount each year which when invested will provide the means for retiring bonds or mortgage indebtedness when due. Without such obligation having been entered into, however, and as a matter of policy, it may be deemed expedient to reduce fixed charges. When the business of the corporation is unusually large, the creation of such a fund may not interfere with the declaration of dividends which will be satisfactory to shareholders; and in time of business depression or lighter traffic, the fund may operate to increase the net income accruals or to decrease charges to such an extent as to protect the management from financial embarrassment and even make possible the payment of dividends.

More directly, dividends may be equalized by appropriating or setting aside a definite reserve. When a road is so located that it must depend for earnings largely on freight traffic and on long haul business, the fluctuations over a period of years may be so great that without such a reserve it would be impossible to pay dividends without depleting the capital invested.

All of these and still other funding purposes may be subserved by the board of directors in the exercise of their proper discretion in the management of surplus. The shareholders have no rights to any part of the earnings or profits until a definite fund has been set aside for distribution to them in the form of dividends.

When the surplus is put back into permanent properties, or invested or set aside as specific reserves for purposes other than dividends, it is not usually available for distribution to shareholders, for it becomes so far merged in the general assets of the corporation that it cannot be readily converted into cash. Under such circumstances the only methods which the board may utilize to enable them to distribute the surplus as dividends are either to issue bonds against the invested surplus, to declare share dividends, or to distribute certificates of beneficial interest in properties which are not essential to the road.

33. HOW ONE FIRM PULLED THROUGH A DEPRESSION[1]

Little more than six months ago [this article appeared in July, 1921] Henry Ford had all but completed arrangements for borrowing $75,000,000, and in the face of what appeared desperate necessity. His plants were closed; there was little demand for his cars; he owed the Government $55,000,000 in taxes; notes for nearly $30,000,000 originally issued to buy out his minority partners were due within a few weeks; a bonus of $7,000,000 was due his employees; whereas cash and treasury bonds together aggregated only $33,000,000.

Yet Ford did not borrow from banks. He paid them up and today his sales are the greatest in history. How was the corner turned? He has told his own story of the triple-faced wedge which he used to open the path that led his industries to a new prosperity. The three faces of this wedge were (1) the shipment of surplus cars, (2) ruthless economies, (3) transportation. The first thing which he did was to transfer the load. He had 125,000 surplus cars on his inventory and he pushed them off his inventory account into the hands of his 17,000 dealers. An Indiana dealer had his floor full of Fords. Imagine his consternation when a trainload rolled, unordered, into the city. His business future was at stake. He must and did accept the draft, but he could not pay for the cars. A former disgruntled Ford leader with superior resources bought the trainload at wholesale and startled the countryside by advertising a bargain sale of Fords. In other cities and towns the dealers went to their banks and borrowed on the cars. Shipments averaged about a tenth of a year's business and the credit was quickly obtainable. The cash flowed back into Detroit and by the middle of April Ford had not only paid up the current quarter's Federal taxes, but had anticipated payment on the remaining $26,000,000 of his purchase notes.

The unloading plan was a success because it was economically sound and ruthlessly applied. Agents were bluntly told they were indebted to the Ford company and that to prosper in the future they must assist now. Those who rebelled were removed. Those who accepted are today the strongest proponents of the Ford methods. At the end of April Ford's inventory had been reduced from $105,000,000 to $63,800,000. He had been manufacturing his inventory, including spare parts, into finished car shipments to dealers which went out with drafts attached. At the above date there was

[1] Adapted by permission from the *Wall Street Journal*, Vol. LXXVIII, No. 10 (1921), pp. 1, 3, and Vol. LXXVIII, No. 18 (1921), p. 1

reported due him more than $40,000,000 representing finished cars, probably 80,000 of them, shipped out and accepted by dealers and carried on the company's books as an asset. This item increased $28,000,000 from the first of the year.

The second method which he used was that of economies in his business. He combed his entire organization. Where he formerly employed 60,000 men to produce an average of 4,000 cars daily he now obtains an output of 4,500 daily with 45,000 men. The $6 minimum wage has been retained, but foremen have been put to work, tasks doubled up and adjustments averaging 20 to 25 per cent reduction made in wages. He did not confine his combing to his factories. He came East and found $91,000,000 in "frozen" cars and parts in New York, Philadelphia and Boston. Changes in personnel followed and others were threatened. The cars began to move out. Mr. Ford said:

Office and factory came in for a housecleaning. Back in November, 1920, our daily expense for labor and commercial overhead charges, cost of material not included, averaged $463,200 to get out an average of 3,146 cars daily, or $146 a car. Now for $412,500 a day we produce an average of 4,392 cars daily, or $93 a car. Formerly fifteen men were employed per day per car. Now it requires only nine.

We went through the offices and cut out a lot of jobs created during the war. We literally took out and sold a trainload of desks. We told the men that occupied these desks that back in the shops there were plenty of good jobs at good pay, if they wanted them. Most of them did. We cut the office forces from 1,074 persons to 528. Telephone extensions were cut about 60 per cent. Interesting but useless statistical systems were abolished.

We went through the shops in the same way. During the war we had a foreman for about every three to five men. Too many foremen sat at desks looking on. We sold all the desks and put most of the former foremen working. We now have a foreman for about every twenty men. Everybody and everything not producing was put in a position where it could produce or was eliminated.

By April 1 conditions had so far improved that factories were again running full tilt. Here enters the previously unemphasized matter of transportation. He began to use his Detroit & Ironton for all inbound and outbound shipments possible, making connections with east and west lines at advantageous points along the road. Mr. Ford said:

Before we got control of this road, it required an average of twenty-two days to haul raw material to the factories, make it into cars and get it to

the dealers. The money tied up stood continually at about $88,000,000. Now that time has been cut to fourteen days. We will cut it still more. Where we had $88,000,000 tied up to make 93,000 cars a month we now make 114,000 cars a month with $60,000,000. This freed $28,000,000 for other purposes.

Since April a further remarkable spurt in Ford business has taken place. Cash the first of June was around $36,000,000 and there were no outstanding obligations except current merchandise acceptances. The measure of sales since that time and now, is factory capacity and not merchandising efforts.

E. Organization for Financial Administration

In view of the importance of the subject and the length of time it has been studied it is quite surprising that there is only a meager and unsatisfactory literature on organization for financial administration. It is even more surprising to find that business practice in this field is quite uncertain and mixed, not to say chaotic. There is no telling what one will find in the "financial department" and no telling what titles its functionaries will bear. Usually there is a "treasurer." His duties may range from those connected with occasional consultation on financial policies or those connected with being little more than a custodian of cash to those involved in drawing a budget and handling all financial and accounting matters. Sometimes there is a "comptroller." He may merely have charge of the accounting, or he may, at the other extreme, be responsible for the original budgeting of the business and then for such supervision as may be necessary to carry out the budget, or his duties may be arranged in some other way. There may be an "auditor," a "credit man," and others.

It is apparent that we shall gain little from digesting either the literature or the current practices of business in our study of the "set up" of a business for financial administration. There is, however, certain common-sense material which is worth surveying.

If we picture an organization in which the financial department has reached such large development as to have at its head a "vice-president in charge of finance" it is clear that it may be charged with the following responsibilities (and if it is not charged with them they must be cared for elsewhere in the organization). (1) The vice-president in charge of finance should, in consultation with the president and general manager, draw up a plan of the ways by which the financial

needs of the business may be met. In some business organizations this includes the responsibility of preparing the budget which forecasts these financial needs. It is better organization in most cases, however, to assign the preparation of the budget to a special assistant connected directly with the office of the president and general manager, or to a department of standards and records. (2) Within this plan he must work out the details of institutions and devices which are to be utilized and the details of how and when to utilize them. (3) He should carry out the operations necessary to bring these detailed plans to accomplishment. (4) He is of course the custodian of receipts and the agency through whom payments of funds are to be made. These are his routine duties as "cash custodian."

It is, furthermore, appropriate that he should be charged with the responsibility for safekeeping financial documents. It is assumed that he will have under him whatever staff may be necessary to carry out these duties.

It is not unusual for the entire accounting of the concern to be under the direction of such a vice-president in charge of finance. This is quite an understandable procedure in the case of a small concern where, indeed, the treasurer may actually be also in active charge of the books. In a large concern it is certainly arguable that the accounting work should be assigned to another department, such as a department of standards and records, thus leaving the vice-president in charge of finance free for more important duties.

It is not unusual, also, for such a vice-president to be given functions which are ordinarily associated with the term "comptroller." In such an event he would keep check on the way in which the various departments are measuring up to such responsibilities as rest upon them in connection with the financial plan of the business. For example, he would be vitally concerned in the ability of the sales department to cause the planned income to flow in and to keep within their planned expenditures, not in the sense that he should supervise their activities in their own field, but in the sense that he would be responsible for securing conformance to the authorized budget. It is obvious that it is entirely arguable that such "comptrollers' functions" might equally well (probably better) be assigned to the department of standards and records.

In our attempt to visualize a possible organization for financial administration we should be able to see the matter more clearly if we had already discussed budgeting (see p. 831). We have, however,

seen enough of what is involved in budgeting (see page 337) to enable us to proceed.

Only a few pages are necessary to give sufficient material for our present purposes. We begin (Selection 34) with a general order issued by one manufacturing concern in the process of defining the jurisdiction of its treasurer. It will be worth the student's while to draw a possible organization chart based on this general order. We then look (Selection 35) at some organization charts dealing with various aspects of financial administration. A selection (No. 36) on financial standards serves to remind us that we have already become aware of the existence of standards in the field (see pp. 333, 385) and to indicate their work and importance. Selection 37 shows concretely one device which the vice-president in charge of finance may use in planning to meet the financial needs of the business.

PROBLEMS

1. Draw up an organization chart based on Selection 34. Does this cover the whole organization for the administration of finance?
2. It was stated that the vice-president in charge of finance has the responsibility for drawing up a plan of the ways by which the financial needs of the business may be met. Give this statement specific content. Do the earlier sections of this chapter give material which will be helpful in this connection?
3. An important school of thought believes it wise to differentiate planning and operation in business. Does the material on page 513 do this? Are they always to be differentiated in an organization chart?
4. What is meant by saying that it is a use of the principle of "checks and balances" when "comptrollership" is separated from "treasureship" in a business organization?
5. What are the arguments for having credits and collections in the sales department? in the financial department? What is your conclusion concerning the proper place?
6. What grounds can you give for the position that it is better to have the preparation of the budget in the hands of an "assistant to the president" than in the hands of a vice-president in charge of finance?
7. What are the grounds for saying that "comptrollership" with respect to the budget should rest with the vice-president in charge of finance? with an assistant to the president? with a department of standards and records?
8. What difference of "flavor" do you sense between "accounting department" and "department of standards and records"?
9. Could a bank more advisedly make a loan on the basis of a budget than on the basis of the material set forth (p. 495) in the reading "What a Bank Wants to Know before Making a Loan"?

10. "The policy used in extending credit and in making collections should be harmonized with the remaining body of policy of the business establishment." Explain.
11. Using Selection 35A, pick out the parts of the chart which have to do with financial administration. Are all items cared for?
12. Are you sure that Selection 35B belongs in a section on financial administration?
13. Draw up an outline of as many *kinds* of financial standards as you can think of.
14. Write a paragraph on the *significance* of financial standards.
15. Where do financial standards come from? How does a business get them?
16. Distinguish between an "income and expenditure" budget and a "receipts and disbursements" budget. What use can a vice-president in charge of finance make of such a budget as is sketched in Selection 37?

34. AN ORDER DEFINING THE JURISDICTION OF A TREASURER[1]

A. *Explanatory note.*—The jurisdictions defined hereinbelow extend to all subsidiaries of the company, except where specifically limited to the company.

B. *Definition of jurisdiction.*—The treasurer will control the following functions, either directly or through the proper line executives, as provided under C. (omitted) hereinafter:

1. Credits and collections
   - *a*) Credits
     - (1) Passing on the credit of all customers either on individual transactions or through O.K. lists
     - (2) Passing on the credit of vendors on request
     - (3) Supervising the methods of gathering credit data by the sales force
     - (4) Reviewing sales terms from the standpoint of credit
     - (5) Furnishing other companies with data as to customers' credits
   - *b*) Collections
     - (1) Determining the manner and place of incoming remittances
     - (2) Recording all moneys received
     - (3) Receipting, where required, for such remittances and indorsing for it, all incoming drafts and checks

[1] Adapted by permission from General Order No. 57 of the Walworth Manufacturing Company.

(4) Preparing and issuing all collection "duns"; drawing all drafts against the company's and its subsidiaries' debtors; conducting all personal collection work and all arrangements for collecting through agencies or attorneys

c) Financial claims

Functional control, including supervision of correspondence and approval of adjustments by claim department having jurisdiction over the handling of all customers and intercompany claims arising out of questions of exchange, cash discount, interest, insurance, and other financial matters

2. Custody and maintenance of funds
   a) Cashing all receipts other than cash
   b) Depositing all cash checks and cashed receipts
   c) Setting up and maintaining all petty cash funds
   d) Making all transfers of funds between depositaries
   e) Negotiating all short-time loans necessary to meet the current obligations of the company under the borrowing limits set by the president, and subject to the countersignature of the president, a vice-president, or a director
3. Disbursements

   Disbursing all moneys, subject to proper voucher authorization, including arrangements with transfer agents in connection with payment of dividends
4. Taxes

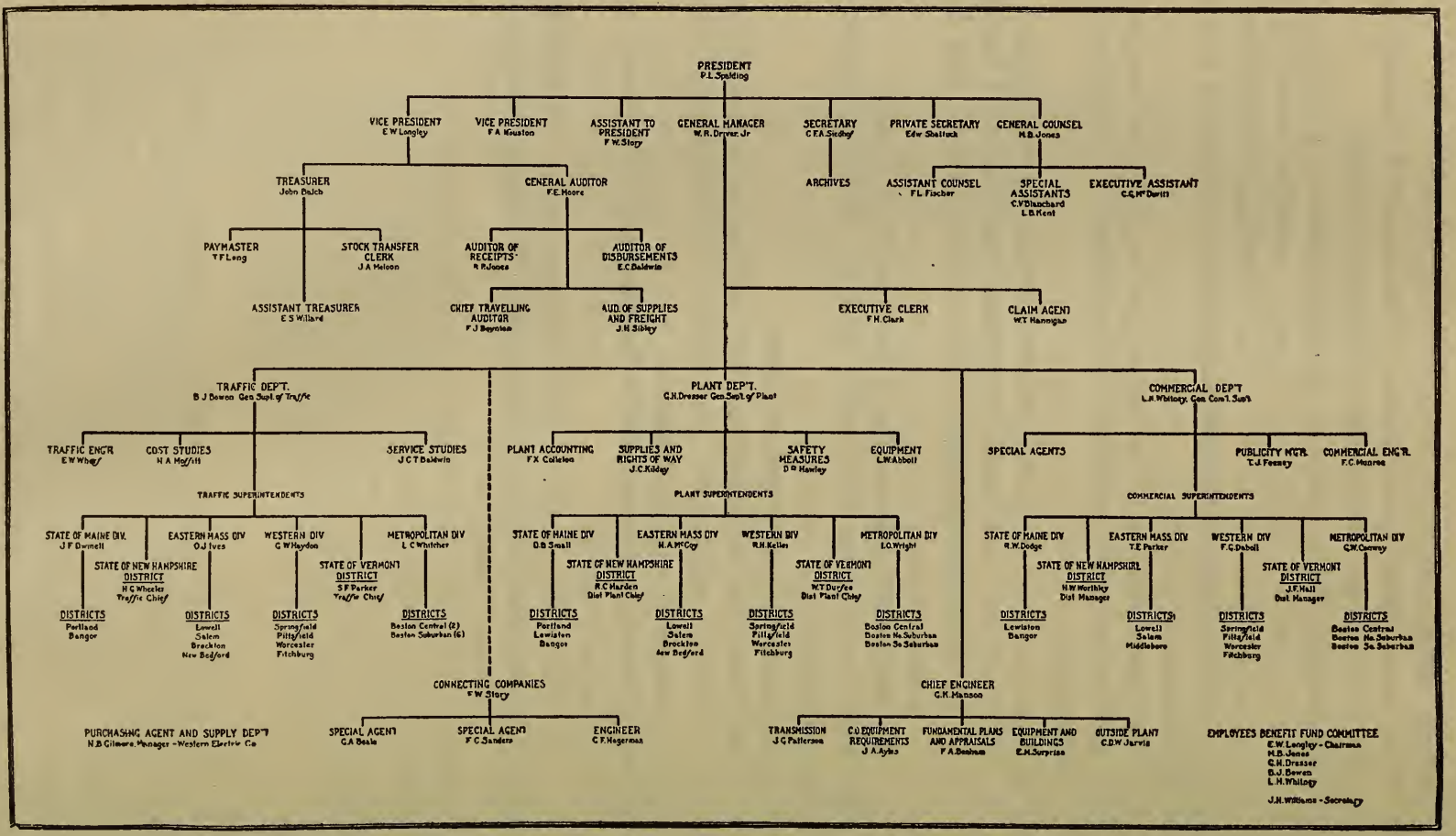
   Preparing all tax returns required by governmental authorities
5. Insurance
   a) Determining the amount of insurance and kinds of policies required to afford all necessary insurance protection, subject to the stipulations of the by-laws as regards surety bonds and to the instructions of the directors as to the basis of valuation in the case of fire and marine insurance
   b) Placing such insurance
6. Real estate

   Purchasing, mortgaging, leasing, renting, and selling all real estate, subject to the approval of the president or Executive Committee or Board of Directors in the case of the Walworth International Company, where the transaction exceeds $1,000.00 in amount, and subject to the approval of the Board of Directors in the case of the sale or lease of any of the capital assets of the company

7. Sale of securities
   a) Recommending for decision by the boards of directors as to the need for and form of all new security issues
   b) Selling, either direct or through banks or syndicates, the company's subsidiary companies' securities, including the publication of all literature and advertising connected therewith, subject to the authorization of the boards of directors
8. Purchase of securities
   Purchasing all outside securities and buying in all company's and subsidiaries' securities, as authorized by the boards of directors
9. Financial statements and notices of dividend declarations
   a) Publishing and issuing all printed reports of the financial condition and progress of the company, other than those covered under A, 7 *b*
   b) Issuing all notices of the declaration of dividends
10. Custody of corporate books, financial documents, and corporate seal
   a) Custody of all corporate books
   b) Custody of all contractual title-vesting and negotiable documents, representing the property and obligations of the company and its subsidiaries
   c) Custody and responsibility for affixing of all corporate seals
11. Financial program
   a) Approving all major appropriations as to availability of funds and all general reductions in selling prices as per General Order No. 41

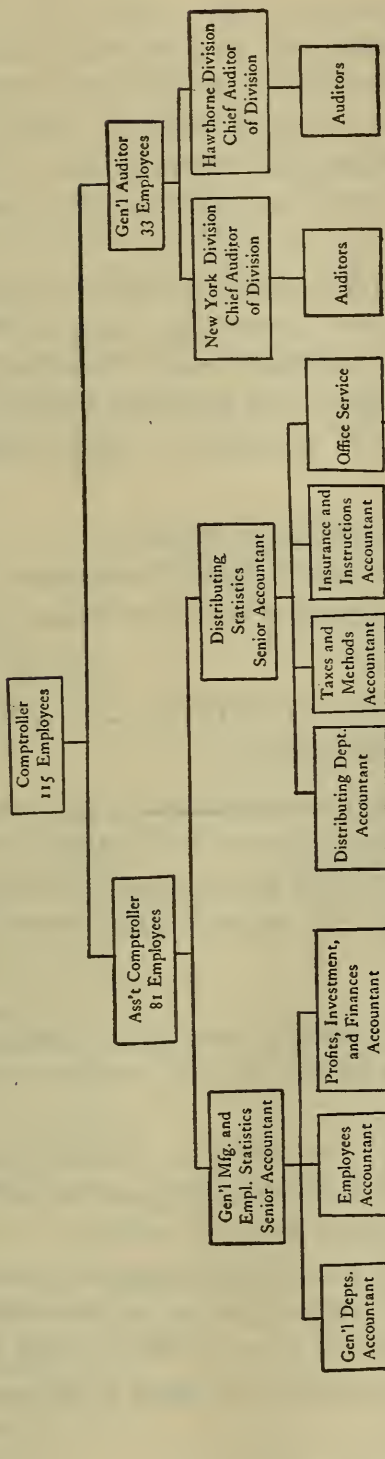
35. TWO ORGANIZATION CHARTS ON FINANCIAL ADMINISTRATION

A. ORGANIZATION CHART OF NEW ENGLAND TEL. & TEL. CO.



How is the accounting handled? Is there any department of standards and records? Is such work being done?

B. ORGANIZATION OF GENERAL ACCOUNTING DEPARTMENT OF WESTERN ELECTRIC CO.



Does this chart care for all financial functions? Does it deal with standards as well as records? Does the concern need a treasurer in addition to this comptroller?

36. FINANCIAL STANDARDS

In financial administration as in other phases of business administration standards of performance are of great assistance, especially if these standards are the result of careful study rather than of blind tradition. In some cases the study must be made by the firm concerned in terms of its own peculiar circumstances; in other cases, the standards may be of wider application and associative study may well be made.

This is an appropriate occasion for reviewing the list of questions prepared by a group of business men concerning financial management (pp. 385–87) for that list of questions was in large part a list of standards which were being sought. We may also wisely look at certain other selections dealing with standards in other fields.

See also p. 221. Some Aspects of Rating Scales.
p. 325–40. Measuring Aids in Sales Management.
p. 370. Testing in Connection with Purchasing.

37. BUDGETING FOR CASH RECEIPTS AND CASH DISBURSEMENTS[1]

[The following selection is written with the underlying hypothesis that a staff assistant to the president is charged with "general control and supervision over the preparation and execution of the budgetary program." It should be read with this organization scheme clearly in mind (compare pp. 831–38).]

1. The staff assistant to the president, working in conjunction with the treasurer, will prepare estimates of cash receipts and cash disbursements for the budget period.

2. In preparing the estimate of cash receipts, the following will be necessary: (*a*) the accounts receivable outstanding at the beginning of the budget period will be analyzed and the estimated monthly receipts from these determined; (*b*) the accounts receivable resulting from the estimated sales will be determined and an estimate made of the monthly collections from these; (*c*) if any notes are held by the company, the estimated monthly receipts from these must be determined.

[1] Adapted by permission from *Budgetary Control for Business*, pp. 1–17. (Boston Chamber of Commerce, 1921.) Prepared under the direction of J. O. McKinsey.

3. In preparing the estimate of cash disbursements, the following will be necessary: (*a*) the treasurer will prepare an estimate of the disbursements for taxes, insurance, interest, and other items which are under his control; (*b*) the accounts payable outstanding at the beginning of the budget period will be analyzed and the estimated monthly disbursements in payment thereof determined; (*c*) the accounts payable which will be contracted in connection with the various estimates calling for disbursements will be determined and an estimate made of the monthly disbursements required in payment of these.

4. The form of the estimate of cash receipts, the estimate of cash disbursements, and the summary of cash receipts and disbursements is shown below.

SUMMARY OF CASH RECEIPTS AND DISBURSEMENTS

For Quarter Ending March 31, 1922

Disbursements	January	February	March	Total
Receipts				
Loans required				

ESTIMATED CASH RECEIPTS

For Quarter Ending March 31, 1922

Source	January	February	March	Total
Accounts receivable*				
Customers—Class A				
Schedule No. 1				
Customers—Class B				
Schedule No. 2				
Customers—Class C				
Schedule No. 3				
Notes receivable				
Not discounted				
Schedule No. 4				
Sales				
Customers—Class A				
Schedule No. 5				
Customers—Class B				
Schedule No. 6				
Customers -Class C				
Schedule No. 7				
Total				

*The classification of accounts receivable is on the basis of the terms of credit on which sales are made

ESTIMATED CASH DISBURSEMENTS

For Quarter Ending March 31, 1922

Purpose	January	February	March	Total
Notes payable				
Accounts payable				
Outstanding, Jan. 1				
Estimated cash disbursements for purchases				
Factory pay-roll				
Department A				
Department B				
Department C				
Factory expense				
Department A				
Department B				
Department C				
Departmental expense				
President's office				
Treasurer's department				
Auditor's department				
Purchasing department				
Office manager's department				
Traffic department				
Sales department				
Production department				
New equipment				
General				
Taxes				
Insurance				
Interest				
Miscellaneous				
Total				

REFERENCES FOR FURTHER STUDY

Moulton, *The Financial Organization of Society.*

Jones, *The Administration of Industrial Enterprises*, chaps. ii, xxi.

Lough, *Business Finance.*

Walker, *Corporation Finance.*

CHAPTER VI

THE ADMINISTRATION OF PRODUCTION

Purposes of this chapter:

1. To secure an appreciation of the spirit of modern production and to see how this spirit came into being.

2. To get an understanding of the outstanding problems in production control.

3. To see something of what is involved in so-called scientific shop management.

The word production is another term which has several meanings. Most economists use the term to include all the steps involved in getting goods into the hands of the ultimate consumer. Thus, to the economist the term includes (*a*) those processes which change the form of goods (confer form utility); (*b*) those which move goods from places of less need to places of greater need (confer place utility); (*c*) those which keep goods from times of less need to times of greater need (confer time utility); and (*d*) those which are concerned with transfer of possession and ownership (confer possession utility). The business man ordinarily uses the term production to mean only those processes which are concerned with conferring form utility, and we shall use the term as it is used by the business man.

Even with this narrowing it is a tremendously broad term. At the very least it includes all the primary industries and all manufacturing industries (see p. 2) and it is quite arguable that it includes more. We are, of course, primarily interested in manufacturing industry. Even in this one field the range of activity is very great.

A. The Background of Modern Production

Production in some form goes back to man's first attempt to modify his environment. It developed slowly and painfully to the kind of tool industry which characterized medieval productive activity, and continued down to the time of the Industrial Revolution. That Revolution marks the transition to a very different kind of production, different both in the character of its processes and in the character of its contribution to human well-being.

We have come to call this new kind of production, *technological industry*. This term is intended to indicate that man has turned, and is more and more turning, to science to get means and methods of harnessing the forces of nature to do his work. Our first task is that of securing an appreciation of the environment in which modern production is conducted.

PROBLEMS

1. Readings 1–5 perhaps give the impression that the Industrial Revolution was entirely dependent upon the coming in of science and technology. Do you know what part was played by the development of (*a*) financial institutions, (*b*) markets and market institutions, (*c*) labor supply?
2. There have been periods of great progress in the past and these periods have frequently been short-lived. Is there anything about modern scientific methods that justifies an expectation that our progress will continue?
3. What do you understand to be the essence of scientific method? Is it applicable to business problems?
4. What is your explanation of the outburst of activity at the beginning of the nineteenth century shown on the chart on page 530?
5. Reading 2 gives us a hint of the contributions botany and physics may make to production. What can geology contribute? chemistry? psychology? mathematics? Be specific.
6. Notice the period in which there occurred the development of schools of technology. Can you relate this to developments in the field of marketing? finance? personnel?
7. How do you explain the great development of such schools in a relatively new country like the United States?
8. You now have certain facts before you concerning the engineering profession. These people seem to be engaged in harnessing the forces of nature to gratify our wants. If they are to be managers in industry, is scientific training in itself sufficient?
9. What does technological industry mean to you? Is it synonymous with machine industry? Could we properly characterize agriculture today as technological industry?
10. You are a general manager of a manufacturing and selling business and you have a limited scientific background. How are you going to handle problems of building construction, power, plant layout, and equipment?
11. Write out the arguments for and against a requirement of physics and chemistry in a business curriculum.
12. Why is it any concern of ours what intellectual effects machinery may have?

13. Be certain that you can explain in definite terms the relationship between technological industry and indirect costs in industry; between indirect costs and large-scale production.
14. What effect has the coming in of technological industry had upon ease or difficulty of control in industry? Explain in detail.
15. "Standardization is the magic word which reveals the circumstances under which an industry lends itself readily to machine methods." What does this mean? Standardization of what?
16. Make a list of the advantages and disadvantages of standardization.
17. "The significant thing about the coming in of machinery is that it meant a transfer of thought, skill, and intelligence." What does this mean? What has been the effect of this transfer upon (*a*) apprenticeship, (*b*) competition among workers, (*c*) the bargaining relation between employer and employee, (*d*) the development of large-scale production, (*e*) the development of impersonal relations, (*f*) the development of working-class solidarity?
18. Draw up a statement of the effect of the machine upon the laborers who work in machine industries; upon other laborers.
19. One writer says that machine methods have profoundly influenced our mental outlook. How could this be true? Have these methods had sufficient time or have they covered a sufficient proportion of our human activities to have had a profound influence of this sort?
20. When we speak of industry in 1750 as having been "simple" and of industry today as being "complex," what do we mean? What are the component elements of this simplicity or complexity?
21. Nowadays one machine completes the process of pin-making which in Adam Smith's day occupied ten men. Has there been an increase or a decrease in specialization?
22. Write a paragraph developing the theme "the background of modern production."

1. A BRIEF OUTLINE OF THE HISTORY OF SCIENCE[1]

The nineteenth century, and particularly the hundred years in which we are now interested, must always stand out in the history of the world as the period which has combined the greatest development in all departments of science with the most extraordinary industrial progress.

So far as man's thought was constructive, the early results were systems of philosophy, and explanations of the order of things as seen

[1] Adapted by permission from E. S. Dana, "The American Journal of Science from 1818 to 1918," in *A Century of Science in America*, pp. 1–20. (Yale University Press, 1918.)

from within, not as shown by nature herself. We date the real beginning of science with the Greeks.

The bringing together of facts through observation alone began, to be sure, very early, for it was the motion of the sun, moon, and stars and the relation of the earth to them that first excited interest, and, especially in the countries of the East, led to the accumulation of data as to the motion of the planets, of comets, and the occurrence of eclipses. But there was no co-ordination of these facts and they were so involved in man's superstition as to be of little value. In passing, however, it is worthy of mention that the Chinese astronomical data, accumulated more than two thousand years before the Christian era, have in trained hands yielded results of no small significance.

It was the branches of mathematics, as arithmetic and geometry and later their applications, that were first and most fully developed: in other words, those lines of science least closely connected with nature. The geometry of Euclid (about 300 B.C.) was marvelous in its completeness as in clearness of logical method. Hipparchus (about 160–125 B.C.) gave the world the elements of trigonometry and developed astronomy so that Ptolemy 260 years later was able to construct a system that was well developed, though in error in the fundamental idea as to the relative position of the earth. It is interesting to note that the *Almagest* of Ptolemy was thought worthy of republication by the Carnegie Institution only a year or two since. This great astronomical work, by the way, had no successor till that of the Arab Ulugh Bey in the fifteenth century, which within a few months has also been made available by the same Institution.

To the Alexandrian school also belongs Archimedes (285–212 B.C.), who, as every schoolboy knows, was the founder of mechanics and in fact almost a modern physical experimenter. He invented the water screw for raising water; he discovered the principle of the lever, which appealed so keenly to his imagination that he called for a fulcrum on which to place it so as to move the earth itself. He was still nearer to modern physics in his reputed plan of burning up a hostile fleet by converging the sun's rays by a system of great mirrors.

To the Romans, science owes little beyond what is implied in their vast architectural monuments, buildings, and aqueducts which were erected at home and in the countries of their conquests. The elder Pliny (23–79 A.D.) most nearly deserved to be called a man of science, but his work on natural history, comprised in thirty-seven volumes,

is hardly more than a compilation of fable, fact, and fancy, and is sometimes termed a collection of anecdotes.

With the fall of Rome and the decline of Roman civilization came a period of intellectual darkness, from which the world did not emerge until the revival of learning in the fifteenth and sixteenth centuries. Then the extension of geographical knowledge went hand in hand with the development of art, literature, and the birth of a new science. Copernicus (1473–1543) gave the world at last a sun-controlled solar system; Kepler (1571–1630) formulated the laws governing the motion of the planets; Galileo (1564–1642) with his telescope opened up new vistas of astronomical knowledge and laid the foundation of mechanics; while Leonardo da Vinci (1452–1519), painter, sculptor, architect, engineer, musician, and true scientist, studied the laws of falling bodies and solved the riddle of the fossils in the rocks. Still later Newton (1642–1727) established the law of gravitation, developed the calculus, put mechanics upon a solid basis, and also worked out the properties of lenses and prisms, so that his *Optics* (1704) will always have a prominent place in the history of science.

From the time of the Renaissance on science grew steadily, but it was not till the latter half of the eighteenth century that the foundations in most of the lines recognized today were fully laid. Our standpoint in the early years of the nineteenth century may be briefly summarized as follows: A desire for knowledge was almost universal and, therefore, also a general interest in the development of science. Mathematics was firmly established and the mathematical side of astronomy and natural philosophy—as physics was then called—was well developed. Many of the phenomena of heat and their applications, as in the steam engine of Watt, were known and even the true nature of heat had been almost established by our countryman, Count Rumford; but of electricity there were only a few sparks of knowledge. Chemistry had had its foundation firmly laid by Priestley, Lavoisier, and Dalton, while Berzelius was pushing rapidly forward. Geology had also its roots down, chiefly through the work of Hutton and William Smith, though the earth was as yet essentially an unexplored field. Systematic zoölogy and botany had been firmly grounded by Buffon, Lamarck, and Cuvier, on the one hand, and Linnaeus on the other; but of all that is embraced under the biology of the latter half of the nineteenth century the world knew nothing.

Now, leaving this hasty and incomplete retrospect and coming down to 1918, we find the contrast between today and 1818 perhaps most strikingly brought out, on the material side, if we consider the ability of man, in the early part of the nineteenth century, to meet the demands upon him in the matter of transportation of himself and his property. In 1800, he had hardly advanced beyond his ancestor of the earliest civilization; on the contrary, he was still dependent for transportation on land upon the muscular efforts of himself and domesticated animals, while at sea he had only the use of sails in addition. The first application of the steam engine with commercial success was made by Fulton when, in 1807, the steamboat "Clermont" made its famous trip on the Hudson River. Since then, step by step, transportation has been made more and more rapid, economical, and convenient, both on land and water. This has come first through the perfection of the steam engine, later through the agency of electricity, and still further and more universally by the use of gasolene motors. Finally, in these early years of the twentieth century, what seemed once a wild dream of the imagination has been realized, and man has gained the conquest of the air; while the perfection of the submarine is as wonderful as its work can be deadly.

Hardly less marvelous is the practical annihilation of space and time in the electric transmission of human thought and speech by wire and by ether waves. While, still further, the same electrical current now gives man his artificial illumination and serves him in a thousand ways besides.

But the limitations of space have also been conquered, during the same period, by the spectroscope which brings a knowledge of the material nature of the sun and the fixed stars and of their motion in the line of sight; while spectrum analysis has revealed the existence of many new elements and opened up vistas as to the nature of matter.

The chemist and the physicist, often working together in the investigation of the problems lying between their two departments, have accumulated a staggering array of new facts from which the principles of their sciences have been deduced. Many new elements have been discovered, in fact nearly all called for by the periodic law; the so-called fixed gases have been liquefied, and now air in liquid form is almost a plaything; the absolute zero has been nearly reached in the boiling point of helium; physical measurements in great precision have been carried out in both directions for temperatures far

beyond any scale that was early conceived possible; the atom, once supposed to be indivisible, has been shown to be made up of the much smaller electrons, while its disintegration in radium and its derivatives have been traced out and with consequences only as yet partly understood but certainly having far-reaching consequences; at one point we seem to be brought near to the transmutation of the elements which was so long the dream of the alchemist. Still again photography has been discovered and perfected and with the use of X-rays it gives a picture of the structure of bodies totally opaque to the eye; the same X-rays seem likely to locate and determine the atoms in the crystal.

Here and at many other points we are reaching out to a knowledge of the ultimate nature of matter.

In geology, vast progress has been made in the knowledge of the earth, not only as to its features now exhibited at or near the surface, but also as to its history in past ages, of the development of its structure, the minute history of its life, the phenomena of its earthquakes, volcanoes, etc. Geological surveys in all civilized countries have been carried to a high degree of perfection.

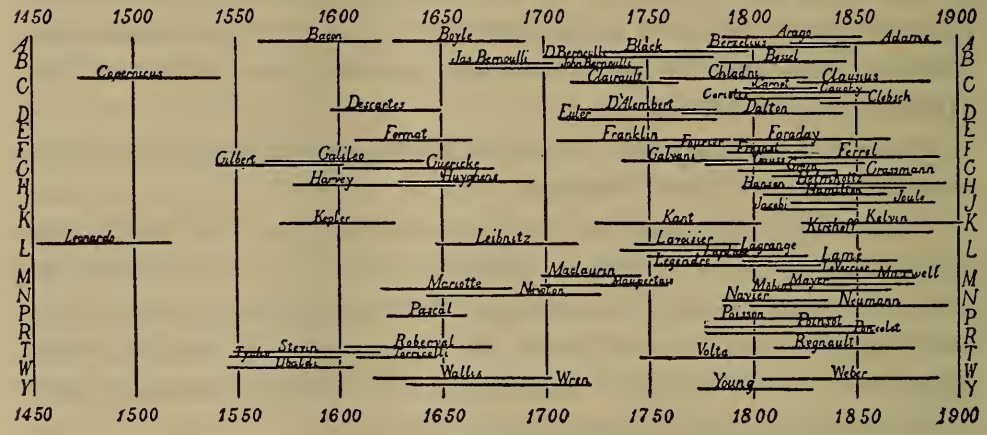
In biology, itself a word which though used by Lamarck did not come into use till taken up by Huxley, and then by Herbert Spencer in the middle of the century, the progress is no less remarkable.

Although not falling within our sphere, it would be wrong, too, not to recognize also the growth of medicine, especially through the knowledge of bacteria and their functions, and of disease germs and the methods of combating them. The world can never forget the debt it owes to Pasteur and Lister and many later investigators in this field.

More important and fundamental still than all the facts discovered and the phenomena investigated has been the establishment of certain broad scientific principles which have revolutionized modern thought and shown the relation between sciences seemingly independent. The law of conservation of energy in the physical world and the principle of material and organic evolution may well be said to be the greatest generalizations of the human mind. Although suggestions in regard to them, particularly the latter, are to be found in the writings of early authors, the establishment and general acceptance of these principles belong properly to the middle of the nineteenth century. They stand as the crowning achievement of the scientific thought of the period in which we are interested.

It might even seem as if the limit of the unknown were being approached. There remains, however, this difference in the analogy, that in science the fundamental relations—as, for example, the nature of gravitation, of matter, of energy, of electricity; the actual nature and source of life—the solution of these and other similar problems still lies in the future.

A GRAPHIC PRESENTATION OF THE HISTORY OF SCIENCE[1]



The lines in this chart show the life-periods of the great masters in the history of dynamics. The names are arranged alphabetically from top to bottom for convenient reference. This chart is typical of the appearance of a similar chart for any of the sciences and is interesting to us because it shows the dearth of workers in these fields in the sixteenth century and the great outburst of activity which took place with the beginning of the nineteenth century.

2. WHAT CAN SCIENCE CONTRIBUTE IN THE FUTURE?

A. A HINT OF THE CONTRIBUTION OF PHYSICS[2]

The spirit of modern science is something relatively new in the world's history. That spirit has three elements. The first is a philosophy, the second is a method, and the third is a faith. Look first at the philosophy. I say that is new for the reason that all primitive peoples, and many that are not primitive, have held a philosophy that is both animistic and fatalistic. Every phenomenon which is at all unusual, or for any reason not immediately intelligible, used to be attributed to the direct action of some invisible personal

[1] Taken by permission from Carl Barus, "Historical Graphics," a letter to *Science*, XXX (1909), 372.

[2] Adapted by permission from R. A. Millikan, "Twentieth Century Physics," *Smithsonian Report for 1918*, pp. 169–84, and "A New Opportunity in Science," *Science*, N. S., Vol. L (1919), pp. 285–97.

being. Witness the peopling of the woods and streams with spirits by the Greeks, the miracles and possession by demons of the Jews, the witchcraft manias of our own Puritan forefathers, only two or three hundred years ago.

Now, the philosophy of physics, a philosophy which was held at first timidly, always tentatively, always as a mere working hypothesis, but yet held with ever-increasing conviction from the time of Galileo, when the experimental method may be said to have had its beginnings, clear up to the present time, is the exact antithesis of the above. Stated in its most sweeping form it holds that the universe is ultimately rationally intelligible, no matter how far from a complete comprehension of it we may now be, or indeed may ever come to be. It believes in the absolute uniformity of nature. It views the world as a mechanism, every part and every movement of which fits in some definite, invariable way, into the other parts and the other movements; and it sets itself the inspiring task of studying every phenomenon in the confident hope that the connections between it and other phenomena can ultimately be found. It will have naught of caprice in nature. It looks askance at mysticism in all its forms whether put forth by Dionysius in Greece in 300 B.C. or by the devotees of Bergson in Paris in 1915. That is the spirit, the attitude, the working hypothesis of all modern science, and let me say that this philosophy is in no sense materialistic, because good, and mind, and soul, and moral values, which is only another word for God, these things are all here just as truly as are any physical objects, and with that kind of a creed they must simply be inside and not outside of this matchless mechanism.

Second, as to the method of science, it is a method practically unknown to the ancient world, for that world was essentially subjective in all its thinking and built up its views of things largely by introspection. The scientific method, on the other hand, is a method which is completely objective. It is the method of the working hypothesis which is ready for the discard the very minute it fails to work. It is the method which believes in a minute, careful, wholly dispassionate analysis of a situation; and any physicist or engineer who allows the least trace of prejudice or preconception to enter into his study of a given problem violates the most sacred duty of his profession.

It is the faith of the scientist, and it is a faith which he will tell you has been justified by works, that man is not a pawn in a game

played by higher powers; that his external, as well as his internal destiny is in his own hands. Take one illustration. In the mystical, fatalistic ages which preceded, electricity was simply the agent of inscrutable Providence; it was Elijah's fire from Heaven sent down to consume the enemies of Jehovah; or it was Jove's thunderbolt hurled by an angry God; and it was just as impious to study so direct a manifestation of God's power in the world as it would be for a child to study the strap with which he is being punished, or the mental attributes of the father who is behind the strap. It was only 150 years ago that Franklin sent up his famous kite, and showed that these thunderbolts were identical with the sparks which he could draw on a winter's night from his cat's back. Then, 30 years after that Volta found that he could manufacture these same thunderbolts artificially by dipping dissimilar metals into an acid. And 30 years farther along Oersted found that those same thunderbolts when tamed and running noiselessly along a wire would deflect a magnet, and with that discovery the electric battery was born, and the erstwhile blustering thunderbolts were set the inglorious task of ringing house bells, primarily for the convenience of womankind. Then 10 years later Faraday found that all he had to do to obtain a current was to move a wire across the pole of a magnet, and in that discovery the dynamo was born, and our modern electrical age, with its electric transmission of power, its electric lighting, its electric telephoning, electric toasting, electric foot warming, electric milking—all that is an immediate and inevitable consequence of that discovery—a discovery which grew out of the faith of a few physicists that the most mysterious, most capricious, and the most terrible of natural phenomena is capable of a rational explanation and ultimately amenable to human control.

In that statement I have revealed the taproot of the civilization of the nineteenth century. Add to it a bit to cover the harnessing of steam, and the development of the principle of the conservation of energy, and you have an epitome of the progress of the century just passed. It all grew out of the application of an extraordinarily small number of discoveries as to the way in which nature works.

There is today a new opportunity in science for the young American who is facing the problem as to where his life can be spent on the whole most effectively. It is to be assumed that most men are at bottom altruistic, that most men seek to direct their lives into channels in which they can make them most worth while for the race. I should like to divide all altruistic effort into three great classes:

The first has to do with efforts toward the improvement of the individual characters and lives of men. This is the field which for thousands of years has been the chief concern of religion, and it is perhaps the most fundamental and most important of all. Its needs and its opportunities are eternal, and no thinking man leaves it out of account. But it is not this field to which I am directing attention today.

The second type of effort has to do, in one form or another, with possible and projected changes in the distribution of wealth. In this category are found all efforts toward social rearrangements, and educational reform, brought about either by legal enactment, or by the development of an enlightened public opinion. No man in his senses would belittle this type of effort. The needs are tremendous and every right thinking man bids every worker of this sort godspeed.

But it may after all be questioned whether effort in this field has as good a chance—I had almost said one-tenth as good a chance—of effectiveness in contributing to human well-being as has effort in the third field, namely, the field which has to do broadly with the creation of wealth rather than with its distribution. This last is the field of scientific and engineering endeavor; for the scientist is, in the broad sense, a creator of wealth as truly as is the man whose attention is focused on the application of science. Indeed, the scientist is merely the scout, the explorer, who is sent on ahead to discover and open up new leads to nature's gold. His motive may be merely to find out how nature works, but once that knowledge has been gained, man almost always finds a way to apply it to his own ends, so that in a very real sense all scientific effort is directed toward the improvement of human well-being through the creation of more wealth.

B. A HINT OF THE CONTRIBUTION OF BOTANY[1]

In the war period we faced what may be called "emergency" problems. This means that there was no time for prolonged research; in fact, what was demanded was available information rather than research. A few illustrations will be given chiefly to illustrate the nature of the needs that developed. All branches of botany were called upon to answer questions, and the committee really acted as a clearing house of information. The emergency problems may be put

[1] Adapted by permission from J. M. Coulter, "Report of the Work of the National Research Council." *School Science and Mathematics*, XXI (1921), 613–17.

under three general heads and were cared for by three different groups.

The first category was food, and numerous questions presented themselves. This food problem may be considered under three heads. The first is food production. Some of the problems already started had a bearing upon this, but had not progressed far enough to be productive. There was a great deal of information available relating to food production, but it was isolated and had never been brought together and focused upon the problem. For example, one of the important things was the problem of adjustment. People everywhere were trying to grow the same crops, in spite of varying conditions. One of the problems was to adjust the proper crop to the locality and soil in order to secure maximum returns. Another problem was the substitution of well known drought-resistant and disease-resistant races for those that are not resistant. There was a great deal of scattered information upon these subjects, but it had to be brought together and made available. Another problem was that of soil management, chiefly a question of fertilizers.

Another phase of the food problem was food conservation. I do not mean conservation in the ordinary sense in which it was used during the war. It was the kind of conservation that started the disease-resistant surveys in the effort to conserve our crops from destruction. The start in this phase of the work was made by that group of botanists known as pathologists. There came in also another feature, the co-operation with the Bureau of Markets. Thorough studies were made of the marketing of products, and everything—from picking and packing to the final distribution—was considered.

The third and very interesting phase of the food problem came under the head of vitamines, a subject that is coming to the front. It was known that the vitamine content of food was very important not on account of what is called food value, but on account of enabling one to use food with the greatest efficiency. It is vitamines that may be said to give a man "pep," and the question was raised in connection with the army ration. The problem was to discover a food with the greatest vitamine content that was capable of transportation and could stand storage. There are certain perishable products rich in vitamines, as liver, lettuce, milk, etc., but of course such products could not be transported in an army ration. A specialist in vitamines undertook the work, and found the greatest vitamine content in

peanuts; but the problem was that when peanuts are roasted the vitamines are reduced. Before the peanut was advised as a part of the army ration, however, the investigator found a wonderful vitamine content in the soy bean, and this became a conspicuous part of the army ration.

The second general category of problems was timber. The first question asked was in reference to the most desirable timber for the manufacture of airplanes. The ordinary timber used for that purpose is spruce, but there was some question as to whether it would not be necessary to provide ourselves with some other kind that might be used when spruce was no longer available. It was a question of fiber, lightness, and elasticity. Some suitable timbers were found, and in connection with working upon them, the pathologists discovered an interesting situation. A disease might have started in the timber in such an inconspicuous way that an ordinary inspector would not detect it. If the timber were put in use the disease would spread, and sooner or later the airplane constructed from it would collapse. Many accidents in the early part of the war seemed to have been due to the fact that these little specks of diseased tissue had not been recognized when the timber was prepared.

The committee was asked also to recommend timbers for various other structures in connection with the war, particularly in connection with the various camps in this country.

The third general category was raw products. Few people realize the number of raw products obtained from plants for various uses, such as gums, oils, resins, fibers, etc. The bulk of these raw products had been imported from various parts of the world, chiefly Europe, and of course this source of supply was cut off. It was necessary to discover new geographical sources or new plant sources. A few illustrations will indicate where the pressure was felt. A substitute for red dyes was needed, and in a comparatively short time two or three common plants were found that yielded a red dye that did fairly well as a substitute. The rubber supply offered another problem. The work had been started even before the war in connection with a Mexican rubber plant, for the Brazilian forests were no longer yielding enough. A substitute equal to the Brazilian rubber was not found, but certain substitutes were made available for supplementing the rubber supply. A number of important drugs were called for which are obtained from plants, the supply of which had been cut off, and a number of these were secured.

3. TECHNICAL EDUCATION[1]

Engineering schools, schools of applied science, institutes of technology—such schools naturally did not appear until the physical sciences obtained a considerable development, and their application to the arts and industries became general. In Europe, where these institutions first came into being, they have often evolved from simple beginnings through successive adaptations to the changing state of scientific knowledge and engineering practice. The earliest schools appeared in France and Germany.

In France the École des Ponts et Chaussées, opened in 1747 as a draughting school, was reorganized in 1760 for the training of engineers for the government service. In 1794, the École Polytechnique was founded to fit men for the engineer and artillery service of the French army. The standards of this school have always been of the highest, and some of the most prominent engineers in private practice, as well as in the government service, have received their training in its classes. In 1829 the École Centrale was founded as a private institution, and has continued to be independent of government aid up to the present time. In this institution a majority of the French engineers not employed in the government service have been educated. A number of high-grade technical schools partly supported by the government exist in important centres outside of Paris, such as the École Centrale at Lyons, École des Mineurs at St. Étienne, and the Institut du Nord at Lille.

In Germany, the beginning of the first technical high schools (as the higher technical schools are now called) was made in Berlin in 1799, in the establishment of an academy for builders (*Bau-Akademie*). In 1821 a trade school (*Gewerbeschule*) was also organized; and by the union of these two in 1879 was created the present technical high school. By 1835 a number of other trade and technical schools, with little uniformity of organization, were established at different places. These schools could only exact low entrance requirements and perform comparatively elementary work, as no schools existed in which a sound preparation in science could be obtained. After the incorporation of the real or scientific school in the German system, the standards of certain of these early technical schools were gradually advanced, and the principle of specialization was introduced; until after a century of development a series of technical schools has evolved taking

[1] Adapted by permission from Nelson's *Perpetual Loose-Leaf Encyclopaedia*, XI, 641–42. (Thomas Nelson and Sons, 1920.)

equal rank with university departments and requiring equal preparation for admission. Today, Germany possesses nine of these splendid institutions—located at Aix la Chapelle, Berlin, Brunswick, Darmstadt, Dresden, Hanover, Karlsruhe, Munich, and Stuttgart—in which the most advanced instruction in engineering, architecture, industrial chemistry, and agriculture is presented.

It is safe to say that the influence of these schools, together with university instruction in pure science, has been one of the strongest single factors in the remarkable industrial development which has been going on in Germany since the middle of the last century, and which has brought her to the front rank among the commercial nations of the world.

In the United States, the institute of technology has received far more attention and attained a much larger development than any other form of technical or industrial school. This development has resulted in a type of institution equal in practical value to the most advanced schools of European countries.

The Rensselaer Polytechnic Institute, the first of such schools established, was founded in 1824 at Troy, N.Y., by Stephen Van Rensselaer, the last of the patroons, as a school of applied science. This institution soon took the form of a school of civil engineering, in which field it has retained a foremost rank to the present time, and its long list of graduates includes many of the most prominent and successful workers in this profession.

The Rensselaer Institute remained the only example of a school of applied science until nearly the middle of the century, when, in response to the growing demand for scientific instruction, the Sheffield Scientific School (1847) and the Lawrence Scientific School (1848) were founded in connection respectively with Yale and Harvard Universities. The instruction in these schools was at first in pure rather than applied science; but later, courses of a true engineering type were developed. It was the period of the Civil War, and the years immediately following, however, that witnessed a general movement toward the establishment of schools of technology. The energy turned back at this time into industrial life, the increased knowledge of the country's resources, and the growth of railroads all tended to set in motion a powerful current of industrial expansion. Technical training was needed to fit men to cope with the new problems presented. In 1861, through the efforts of William Barton Rogers, the charter of the Massachusetts Institute of Technology was granted, and in 1865 the first classes were organized.

The Worcester Polytechnic Institute was founded by John Boynton, a successful Massachusetts merchant, in 1864, and was opened in 1867. Shop work has been one of the prominent features of the educational work of this institution since its foundation. In 1864 the School of Mines of Columbia University was created, out of which have grown the several schools under the faculty of Applied Science in that institution. In 1865 Lehigh University was founded by the Hon. Asa Packer of Mauch Chunk, and in 1866 courses in several branches of engineering were organized. In 1871 the Stevens Institute of Technology opened its classes. The Sibley College of Mechanical Engineering and the Mechanic Arts was organized at Cornell University in 1872, and other courses in engineering were soon added.

In the next twenty years a large number of schools of advanced rank were founded either as separate institutions or departments of universities. The earlier schools were mainly on private foundations, but the passage of the Morrill Act by Congress in 1862, under which large land grants were made to the States for the support of instruction in the agricultural and mechanical arts, resulted shortly in the inclusion of engineering departments in most of the Western State colleges and universities.

Among those of the first group are Purdue University, Lafayette, Ind.; the Rose Polytechnic, Terre Haute, Ind.; the Case School of Applied Science, Cleveland, Ohio; the University of Pennsylvania; Washington University, St. Louis, Mo.; and the Leland Stanford Junior University of California. Of later establishments are the Armour Institute of Chicago and the Carnegie Technical Schools of Pittsburgh.

Prominent state institutions are the Ohio State University, Michigan College of Mines, the Universities of Illinois, Michigan, Minnesota, Missouri, Nebraska, Wisconsin, and California, Pennsylvania State College, and the Iowa State College of Agriculture and Mechanical Arts.

According to the report of the U.S. Commissioner of Education for 1910, there were 129 universities, colleges, or schools of technology in the United States giving courses in engineering. There was reported a total of 30,337 students engaged in engineering studies, among which were the following: architecture, 775; civil engineering, 7,889; chemical engineering, 869; electrical engineering, 5,450; mechanical engineering, 6,377; mining engineering, 2,656; forestry, 546; chemistry, 4,807. In addition to these there were 11,163 students reported as engaged in general science study.

4. THE ENGINEERING PROFESSION[1]

If the writer may modestly put forward a suggestion for a definition, he would word it: "The Engineer is he who by science and by art so adapts and applies the physical properties of matter and so controls and directs the forces which act through them as to serve the use and convenience of man, and to advance his economic and material welfare."

In making the following classification of engineers it is obvious that agreement cannot be secured from all as respects the number of branches to be recognized. With this apology and for the purpose in hand there are at least thirteen:

a) The mining engineer and his close ally, the metallurgical engineer, are concerned with the discovery and the winning and extraction from the earth of its buried treasures of oil, fuel, and rock. He touches the geologist and mineralogist on one side of his functions, and the chemist upon the other. Midway he allies himself to the mechanical engineer for the power to overcome his resistances and to the electrical engineer for its convenient transmission to the working point. If he concentrates his ore after winning it from the earth he calls again for his machinery upon the mechanical engineer. The metallurgical engineer who transforms the crude ore into marketable metal or into the merchant form or structural shape is allied to the chemist upon the one side for his processes, and to the mechanical engineer upon the other for his machinery. The electrical engineer is more and more furnishing him the energy for conversion by heat through electrical channels, the mechanical engineer furnishing the latter his power. The mining engineer may be both miner and metallurgist. The iron and steel metallurgist is usually a mechanical engineer.

b) The electrical engineer is primarily entrusted with the transformation of mechanical or chemical energy into electric form, and its transmission in that form to the point of use, where it will be again converted into some other shape. The electrical engineer has made his own the question generating such electric energy for the solution of the problems of lighting, transportation of passengers by railway, and communication by telegraph and telephone. He touches the physicist in the realm outside his applications of science, and has the mechanical or hydraulic engineer next to him to supply mechanical

[1] Adapted by permission from F. R. Hutton, "The Mechanical Engineer and the Function of the Engineering Society," *Proceedings of the American Society of Mechanical Engineers*, XXIX (1907), 602–13.

energy to his generator, and the mechanical engineer beyond him, where his energy drives the tool, or operates the pump or the elevator. Where his energy is made to appear as high heat, he serves the metallurgist, the chemical engineer; where it appears as low heat or as light, he serves the individual members of the community directly, as he does in the problem of communicating speech. His field is very definite.

c) The naval engineer and marine architect is a specialized mechanical and structural engineer. His hull is a truss unsymmetrically loaded and variably supported: his motive power a definite yet widely diversified problem. He covers in addition a wide range of special problems when his vessel is also a clubhouse or hotel, on the one hand, or a powerful fighting machine upon the other.

d) The military engineer must cover both the defensive and the offensive department of his avocation. On the one side he is a structural engineer, and the problems of effective transportation enter his field, which he therefore shares with what is usually called the civil engineer. On the side of attack, the problems of ordnance both for its construction and for its operation take him into the field of the mechanical engineer and electrical engineer, and his problems touch those of the physicist and the chemist and the mathematician on the research and theoretical side.

e) The chemical engineer is a new applicant at the door of professional recognition in certain quarters. He is the engineer in charge of production or manufacture where the process or the product, or both, are chiefly or entirely dependent upon the theories and practice of chemistry. He shares his field with the metallurgical engineer as respects the manufacture of metals; he is a mechanical engineer as soon as the plant becomes large enough to warrant the application of power and machinery to the mechanical handling of his product. Gas-plants, sugar and oil refineries, and the straight chemical manufacturing corporations call for such a man, whatever his designation. It would appear, however, that the normal tendency of growth and development in this field will be toward the utilization of two types of man. The one will be the chemist and the scientist; the other will be the mechanical engineer and executive.

f) The sanitary engineer is a specialist in hydraulic engineering in the applications of water supply and drainage as means to secure the well-being of the community as respects its public health. His co-workers are the bacteriologist and the physician. It would seem

more serviceable, however, for the purpose in hand to group such men with what are hereafter to be called the civil engineers.

g) The heating and ventilating engineers, making a specialty of the sanitary requirements of enclosed houses as respects their fresh and tempered air supply, are really sanitary engineers, having, however, an outlook and a relation to mechanical engineering in the appliances of their function rather than toward civil engineering.

h) The refrigerating engineer is concerned with the transformation of mechanical or heat energy so as to lower the amount of such intrinsic energy in any material or space. He is most unassailably a mechanical engineer.

i) The hydraulic engineer is of two groups. The one type, concerned with the problems of the river or canal for navigation or for power with the dam and its accompanying details of waterways and controlling gatehouses and sluices; and with the gravity storage and distribution by mains of the city water supply has plainly his outlook toward civil engineering. The other type, concerned with the water motor and its attached machinery for its operation, with the mechanical handling of water for city use or for power in industry, the designer of pumps and hydraulic utilization machinery, has his outlook equally definite upon the field of the mechanical engineer. The future is likely to see this differentiation emphasized, the one class calling himself a civil and hydraulic engineer, and the other class a mechanical and hydraulic engineer.

j) The gas engineer has two sets of problems: The one is the intra-mural manufacture and storage of his product, where his functions are those of the chemical manufacturer, and he should be both chemical and mechanical engineer; the other is the distribution problem for whose solution is required the skill and knowledge of a type which is unnamed, but which, logically in parallel with the hydraulic engineer above, should be called the pneumatic (or gas) engineer.

k) There is no recognized group of engineers of transportation, or transportation engineers. Such a group obviously exists, however, whether or not the name is attached to an organization inclusive of all, or is in general use. Such are the engineers of motive power on the steam railways, with the master mechanics and the signal engineers and the operative class on locomotives; such are the street railway engineers; the car builders; the maintenance-of-way engineers, the bridge engineers, the engineers of floating equipment. From the

bottom of the rail upward, these have their outlook on mechanical or electrical engineering; from the bottom of the rail downward, upon civil engineering.

l) The foregoing group does not claim to be exhaustive nor inclusive of all subdivisions of engineers even so far as it has gone. The current activities of the Engineering Building reveal bodies of municipal engineers, of illuminating engineers, of engineers concerned in fire protection, and many others. But the purpose has been to clear the way for the separation of the two most closely allied in function and service, the civil and the mechanical engineer. The civil engineer is confessedly differentiated from the electrical and from the mining engineer: he has been more and more utilizing the achievements of the mechanical engineer, or the latter has been invading the former field of the civil engineer.

It is plain that to the civil engineer belong as of right all problems relating to the canal, the lock, the river, the harbor, the dock, the sea-wall, the break-water, the highway, the aqueduct, the bridge, the viaduct, the retaining wall, the permanent way of the railway below the foot of the rail. He also has nearly the whole of the municipal problem in streets, sewage, distribution of water; the location of railways, with geodetic and other surveying, are his. He has the foundation of structures in any event, but may have to share the roof and the skeleton steel frame with other specializations. Tunneling is usually done by civil engineers, although it was originally a mining engineer's prerogative.

m) To the mechanical engineer, on the other hand, belong as undoubtedly, and as of right, the problems of the generation of power in power houses and power plants, and its transmission to the operative point unless this latter is done by electric means. It is also plain that to the mechanical engineer belong all design, creation, and manufacture of tools and machinery. This makes him therefore the natural administrator or executive of the production processes involving the use of machinery in factories and mills, and it is here that he finds his broadest scope and widest opportunity, as will be further demonstrated hereafter. As creator of machinery, he will be a draftsman or designer of a producing plant; as operator of the plant considered as a tool for production, he will be a general manager or superintendent, or will perform these functions as owner or as president, vice-president, agent, secretary, or treasurer. As a producer of power, the railway will make the mechanical engineer their superin-

tendent of motive power, and the rail and joint become also responsibilities of his; as administrator of men and machinery, he becomes master mechanic of the railway, and more and more such engineers are chosen to be general superintendents. The automobile or motor vehicle engineer is of course a mechanical engineer. From his knowledge and special training he becomes the inspector and tester for all departments of mechanical production.

5. SOME CONSEQUENCES OF TECHNOLOGICAL INDUSTRY

A. THE TRANSFER OF THOUGHT, SKILL, AND INTELLIGENCE

I[1]

Suppose it be desired to drill four holes in a number of plates, so that they bear a certain fixed relation to the edges of the plate; and suppose the operator to be equipped with the ordinary drilling machine which guides the drill so that it pierces the plate squarely. To drill these holes in *one* plate, with any degree of accuracy, requires a high degree of skill on the part of the operator; and to drill any number of such plates so that the spacing of the holes in them will correspond closely with those in the first plate requires a very high degree of manual skill, considerable time per plate, and is a very costly operation.

Suppose, however, a skilled workman makes a so-called "drilling jig" in which the plate can be securely clamped by set screws and in which all the plates can in turn be clamped in exactly the same position. The plate contains four holes, which have been very carefully located to correspond with the required location of the holes.

Now it is evident that almost any *unskilled* person can drill the plate, when so held, as accurately as the most skilled workman can without it. Further, he cannot drill the plate *inaccurately*. True, he must have a slight amount of training in handling the drilling machine, but this is small and soon acquired. *The accuracy of the work no longer depends on the skill of the operator but on the accuracy of his tools.*

This principle, illustrated above, has been aptly called "The Transfer of Skill," and it is to be especially noted that this principle has nothing to do with division of labor, though, as can be seen, it allows an extension of the same. Nor is the principle inherently

[1] Adapted by permission from D. S. Kimball, *Principles of Industrial Organization*, pp. 10–13. (McGraw-Hill Book Company, 1913.)

applicable to *machines* alone; it can be and is applied to hand methods. True, most machines are constructed with this end in view, the drilling machine mentioned above, for instance, having this characteristic in so far as guiding the drill vertically is concerned.

It is evident that for a given operation the more skill that is transferred to the machine the less is required in the operator. When nearly all the skill has been so transferred, but the machine still requires an attendant, it is called a *semi-automatic machine.* Turret lathes are excellent examples of this class of machinery.

In drilling the plate without the jig the skilled mechanic must expend *thought* as well as skill in properly locating the holes. The unskilled operator need expend no thought regarding the location of the holes. That part of the mental labor has been done once for all by the toolmaker. It appears, therefore, that a *transfer of thought* or *intelligence* can also be made from a person to a machine. If the quantity of parts to be made is sufficiently large to justify the expenditure, it is possible to make machines to which all the required skill and thought have been transferred and the machine does not require even an attendant. Such machines are known as *full automatic machines.* Automatic screw machines are excellent examples of a complete transfer of skill and thought. Care should be taken to distinguish clearly between *transmission* of intelligence, as illustrated in drawings, specifications, and written or spoken communications in general, between *men* and the transfer of intelligence or thought from a skilled man to a *machine.* These principles, transfer of skill and transfer of thought, lie at the bottom of modern industrial methods. Under former and simpler methods of manufacture the machine was an aid to the worker's skill, the amount of skill that had been transferred being very small. In the new machines the transfer of skill and thought may be so great that little or none of these are required of the attendant worker.

II[1]

Modern industry is stated by some writers to have begun in 1738 when John Wyatt brought out a spinning machine. Others place the period as between 1750 and 1800, when the power loom and steam engine came into being. It was marked by the development of labor-saving machinery. It was brought about by the change from handicraft to manufacture.

[1] Adapted by permission from the *Majority Report of the Sub-Committee on Administration of the American Society of Mechanical Engineers*, 1912.

Early British economists held that the application of the principle of division of labor was the basis of manufacture. From Adam Smith's *Wealth of Nations*, 1776, we quote:

> This great increase of the quantity of work which, in consequence of the division of labor, the same number of people are capable of performing, is owing to three different circumstances: first, to the increase of dexterity in every particular workman; secondly, to the saving of the time which is commonly lost in passing from one species of work to another; and lastly, to the invention of a great number of machines which facilitate and abridge labor, and enable one man to do the work of many.

Charles Babbage, the great British mathematician and mechanician, believed that from the above-quoted statement the most important principle was omitted. This omission he supplied as follows in his *Economy of Machinery and Manufacture*, 1832.

> That the master manufacturer, by dividing the work to be executed into different processes, each requiring different degrees of skill and force, can purchase exactly that precise quantity of both which is necessary for each process; whereas, if the whole work were executed by one workman, that person must possess sufficient skill to perform the most difficult, and sufficient strength to execute the most laborious, of the operations into which the art is divided.

It appears, however, that another principle is the basic one in the rise of industry. It is the transference of skill. The transference of skill from the inventor or designer to the power-driven mechanism brought about the industrial revolution from handicraft to manufacture. After the traditional skill of a trade, or the special, peculiar skill of a designer or inventor, has been transferred to a machine, an operator with little or no previously acquired skill can learn to handle it and turn off the product.

Methods of analyzing and recording operations were early developed. Adam Smith records the divisions of the work of manufacturing pins, listing eleven operations. Charles Babbage gives a table from a French investigator, showing the number of operations, time for each, cost of each, and expense of tools and material for making pins in France in 1760. He gives a similar table for English manufacture in his day.

Thus we see the application of the principle of transference of skill at the basis of the development of the industry and an early appreciation of the value of the detailed study of operations in making that transference more complete. But the machine was the viewpoint.

It was looked upon as the producing unit. Combined and contrasted with this was a lack of knowledge of scientific principles and their sure application. Charles Babbage treats of this forcefully. We quote:

> There is perhaps no trade or profession existing in which there is so much quackery, so much ignorance of the scientific principles, and of the history of their own art, with respect to its resources and extent, as is to be met with amongst mechanical projectors.

In the same vein he emphasizes the need of accurate drawings as if having in mind the poor quality of the work from the average draftsman of his day. He further points out that there is another important factor in successful industry, in addition to machinery. We read that "in order to succeed in a manufacture, it is necessary not merely to possess good machinery, but that the domestic economy of the factor should be most carefully regulated."

These quotations foreshadow modern methods of thinking out the work in advance and transferring this thought to the workmen. But from the period of the last quotation almost to the present there has been no change in the basic principles discovered and applied in industry. There has been nothing but an extension of those already known. The place of greatest advance has been in the drawing room. The art of machine design has been greatly developed. The last half of the last century saw a tremendous increase in inventions, a tremendous furtherance of the application of transference of skill to machines and tools. The skeleton of an industrial organization of this period, one that was too large for a single executive to manage, consisted of a designing department and a production department, each with a head responsible to the manager.

The first of these, the one that was the means of embodying skill in the machinery and tools of production, was highly developed and organized. Experiment, research, and detailed study were constantly resorted to, to aid in reaching the desired result. The work was highly specialized and the employees highly paid. Not infrequently the manager or chief executive devoted much of his own time to this part of the business.

The production department presented a contrasting condition. The workmen were given the tools and machines designed to the drawing room and using their own unaided skill were expected to produce work of the desired quality and quantity. Except in rare instances no effort was made to transfer the skill of the management

to the production department and the employees, or to undertake the division of executive thought. Very little consideration was given to the workmen as a producing unit.

Within the past twenty or twenty-five years certain changes have taken place in the attitude of many production managers toward the problems that they face and the forces and means that they control. An increasing amount of attention is being given to the worker. But the most important change, and one that comprehends the others, is in the mental attitude toward the problems of production. The tendency is toward an attitude of questioning, or research, of careful investigation of everything affecting the problems in hand, of seeking for exact knowledge and then shaping action on the discovered facts. It has developed the use of time study and motion study as instruments for investigation, the planning department as an agency to put into practice the conclusions drawn from the results of research, and methods of wage payment which stimulate co-operation.

All of these changes have affected the production department much more than the designing department. The effect is to extend the principle of transference of skill to production, so that it completely embraces every activity in manufacture. The skill of the management is consciously transferred to all of the operations of the factory. This extension is expressed by these phrases: the drawing room is the planning department of design, and the planning department is the drawing room of production.

We conceive the prominent element in present-day industrial management to be *the mental attitude that consciously applies the transference of skill to all the activities of industry.*

B. THE INTELLECTUAL EFFECTS OF MACHINERY[1]

The question of the net intellectual effects of machinery is not one which admits of positive answer. It would be open to one to admit that the operatives were growing more intellectual and that their contact with machinery exercises certain educative influences, but to deny that the direct results of machinery upon the workers were favorable to a wide cultivation of intellectual powers, as compared with various forms of freer and less specialized manual labor. The intellectualization of the town operatives (assuming the process to be taking place) may be attributable to the thousand and one other

[1] Adapted by permission from J. A. Hobson, "The Influence of Machinery," *Political Science Quarterly*, VIII (1893), 111–23.

influences of town life rather than to machinery, save indirectly so far as the modern industrial center is itself the creation of machinery. It is not, I think, possible at present to offer any clear or definite judgment. But the following distinctions seem to have some weight in forming our opinion.

The growth of machinery has acted as an enormous stimulus to the study of natural laws. A larger and larger proportion of human effort is absorbed in processes of invention, in the manipulation of commerce on an increasing scale of magnitude and complexity, and in such management of machinery and men as requires and educates high intellectual faculties of observation, judgment, and speculative imagination. Of that portion of workers who may be said, within limits, to control machinery, there can be no question that the total effect of machinery has been highly educative. Some measure of these educative influences descends even to the "hand" who tends some minute portion of machinery.

So also allowance should be made for the skilled work of making and repairing machinery. The engineer's shop is becoming every year a more and more important factor in the equipment of a factory or mill. But though "breakdowns" are essentially erratic and must always afford scope for ingenuity in their repair, even in the engineer's shop there is the same tendency for machinery to undertake all work of repair which can be brought under routine.

Finally it should be borne in mind that in several large industries where machinery fills a prominent place the bulk of the labor is not directly governed by the machine. This fact has already achieved attention in relation to railway workers. The character of the machine certainly impresses itself upon these in different degrees, but in most cases there is a large amount of detailed freedom of action and scope for individual skill and activity.

Making allowance, then, for the intelligence and skill used in the invention, application, management, and repair of machinery, what are we to say of the labor of him who, under the minute subdivision enforced by machinery, is obliged to spend his working life in tending some small portion of a single machine, the whole work of which is to push some single commodity a single step along the journey from raw material to consumptive good?

His work, it is urged, calls for "judgment and carefulness." So did his work in manual labor before the machine took it over. His "judgment and carefulness" are now confined within narrower limits

than before. The responsibility of the individual worker is greater, precisely because it is narrowed down so as to be related to and dependent on a number of other operatives in other parts of the same machine with whom he has no direct personal concern. Such realized responsibility is an element in education, moral and intellectual. But this responsibility is a direct result of the minute subdivision. It is, I think, questionable whether the vast majority of machine workers get any considerable education from the fact that the machine in conjunction with which they work represents a huge embodiment of the delicate skill and invention of many thousands of active minds, though some value may be accorded to Mr. Cooke Taylor's contention that "the mere exhibition of the skill displayed and the magnitude of the operations performed in factories can scarcely fail of some educational effect."

The work of tending machinery is not of course to be regarded as absolutely automatic. To a certain limited extent the "tender" of machinery rules as well as serves the machine: in seeing that his portion of the machine works in accurate adjustment to the rest, the qualities of care, judgment, and responsibility are evoked. A great part of modern inventiveness, however, is engaged in devising automatic checks and indicators for the sake of dispensing with human skill and reducing the spontaneous or thoughtful elements of tending machinery to a minimum.

So far as the man follows the machine and has his work determined for him by mechanical necessity, the educative pressure of the latter force must be predominant. Machinery like everything else can only teach what it practices. Order, exactitude, persistence, conformity to unbending law—these are the lessons which must emanate from the machine. They have an important place as elements in the formation of intellectual and moral character. But of themselves they contribute a one-sided and very imperfect education. Machinery can exactly reproduce; it can, therefore, teach the lesson of the exact reproduction, an education of quantitative measurements. The defect of machinery, from the educative point of view, is its absolute conservatism. The law of machinery is a law of statical order, that everything conforms to a pattern, that present actions precisely resemble past and future actions. Now the law of human life is dynamic, requiring order, not as valuable in itself, but as the condition of progress. The law of human life is that no experience, no thought, or feeling is an exact copy of any other. Therefore, if you confine

a man to expending his energy in trying to conform exactly to the movements of a machine, you teach him to abrogate the very principle of life. Variety is the very essence of life and machinery is the enemy of variety. This is no argument against the educative uses of machinery, but only against the exaggerations of these uses. If a workman expend a reasonable portion of his energy in following the movements of a machine, he may gain a considerable educational value; but he must also have both time and energy left to cultivate the spontaneous and progressive arts of life.

It is often urged that the tendency of machinery is not merely to render monotonous the activity of the individual worker, but to reduce the individual differences in workers. This criticism finds expression in the saying: "All men are equal before the machines." So far as machinery actually shifts upon natural forces work which otherwise would tax the muscular energy, it undoubtedly tends to put upon a level workers of different muscular capacity. Moreover, by taking over work which requires great precision of movement, there is a sense in which it is true that machinery tends to reduce the workers to a common level of skill, or even of un-skill.

But this is by no means all that is signified by the "equality of workers before the machine." It is the adaptability of the machine to the weaker muscles and intelligence of women and children that is perhaps the most important factor. The machine in its development tends to give less and less prominence to muscle and high individual skill in the mass of workers, more and more to certain qualities of body and mind which not only differ less widely in different men, but in which women and children are more nearly on a level with men.

C. TECHNOLOGICAL INDUSTRY IS COMPLEX INDUSTRY

Industry that is dependent upon modern technology is very different from the tool industry of medieval times.

1. Capital is not as mobile as in the medieval period. The railroad industry furnishes an extreme illustration of this fact. This industry is pre-eminently an industry of much fixed, specialized capital. Tracks, locomotives, cars, etc., require tremendous outlay, and when these instruments have been called into being they can be used only for the one purpose. Social capital has been committed to the enterprise in a way that is irrevocable. In both the railway and in other businesses not merely fixed capital but the expensive and intricate organization, both industrial and commercial, make changes

difficult unless one is willing to incur heavy costs. Under the régime of simple industry, processes were simple and little capital was required for any new business venture. If the venture proved unsuccessful, the enterpriser could shift fairly readily to some other line of activity. His loss of capital in the old enterprise would not be great nor would his capital requirements in the new enterprise be unduly large. It is self-evident that a very different situation obtains in complex industry.

2. In complex industry a large part of the costs of operation is without any very definite relation to the volume of the business transacted. In the railroad business it may well happen that 60 per cent of the total costs go on independently of changes in the volume of the traffic. This being true, it is not difficult to understand why the railroad manager who will develop new business is eagerly sought after; nor is it difficult to see the justification of building branch lines which are not in themselves profitable, but which bring in a little more traffic for a long haul on the parent line. From a manager's point of view, it is clear that he should give low rates on cheap and bulky commodities in order to induce them to move and thus increase the volume of his business. Thus the significance of the principle of "charging what the traffic will bear" is apparent, as is also the interest of the public in reduced rates as business develops. Failure to reduce rates under such circumstances might mean excessive profits for a public utility.

3. This is perhaps only another way of saying that under complex industry the relation between total cost of production and the price of the product may be neither clear nor definite. Total cost in machine industry may be divided into two parts: (*a*) those costs specifically incurred for a given unit of business and which are variously known as prime costs, direct costs, or variable costs; (*b*) those costs which are largely independent of the volume of the business and which have been called supplementary costs, indirect costs, overhead costs, or constant costs. The preceding paragraph showed that it pays to get business at a price which is below total cost, provided that price is above prime cost. In addition to this situation, there are plenty of cases where it will be wise for the manager of a complex industry to continue his business even though the price received for his product does not suffice to cover even the prime cost. For example, it has been asserted that a certain railroad has throughout its history hauled coal at less than prime cost because the railroad

believed that this was the policy it must follow in order to develop manufacturing industries along its lines, and thus secure the traffic and profits involved in the hauling of manufactured goods. Another example may be found in the case of a manufacturer who believes that by a short war he may drive one or more of his competitors out of the field, and who accordingly cuts his price below even prime cost. Of course this cannot be expected to continue as a permanent policy. Another and a somewhat more subtle case is to be found when the price is to be cut below prime cost in order to develop added business of the same type. The logic of this situation lies in the fact that the increased volume of business may result in a different proportioning of the prime and supplementary costs through the introduction of special facilities for handling this new business. The consequence is that the price which was formerly below prime cost is now higher than prime cost because the prime cost (per unit) has fallen.

4. It is difficult for the manager to have complete knowledge of the factors involved. On the organization (both commercial and industrial) sides of his work, this is readily seen. The pressure for added business generally brings about a steady increase in the scale of operations so that personal supervision and control are no longer sufficient. Impersonal devices must be called to the rescue.

Of these impersonal devices, accounting, and especially cost-accounting, stands out prominently. Cost-accounting in simple industry would not be a difficult matter. It would involve no intricate computations. In complex industry, however, the cost-accountant must grapple with both direct and indirect costs. He must find methods of distributing the indirect costs over the units produced. If this is well done, it will be of great value, not merely with respect to finding what costs *have been*, but also with respect to determining what costs *ought to be*.

5. Competition is not a satisfactory "law of trade" in complex industry, and the incentives to combination are exceedingly strong. The railroad industry again gives an excellent illustration:

If once a rate war breaks out there seems to be no stopping-place. The field cannot be abandoned, for the instrument can produce nothing but transportation, and a large part of the charges (e.g., interest on bonds) would accumulate even if not a train moved. If traffic falls off, costs will not fall proportionately. It follows then, that a manager may go on for long periods "producing transportation" and collecting a rate which does not cover his total cost per unit,

provided the rate covers added cost per unit or more. As has been seen, he *may* produce at less than added cost per unit. In addition, since the costs are largely joint costs, it may be impossible to know definitely until after it is all over just where the line between "paying" and "losing" business is (a situation particularly true in the earlier days of our railroads). It is not surprising that we have "Cut-throat Competition" under such circumstances.

D. TECHNOLOGICAL INDUSTRY IS FREQUENTLY LARGE-SCALE INDUSTRY[1]

A manager who is trying to arrive at a size of maximum efficiency will continually be considering such questions as these:

1. What effect will increased size have upon my costs of manufacture? Our study of indirect costs enables us to know some of the things which will pass through the manager's mind in this connection.

2. What effect will increased size have upon my marketing problems, including both the purchase of materials and the selling of the finished product and transportation costs in both connections?

3. What effect will increased size have upon the ease of difficulty of bearing the risks of my industry?

4. Will the efficiency of administration, in relationship to its costs, be increased or diminished by a growth in size?

As the manager studies these issues he sees cases where there are distinct advantages in large-scale production.

The first great group of advantages centers around the lowered costs of production arising from such factors as these: (1) the spreading of the indirect costs of a business over a large number of units of business; (2) the better utilization of the principle of division of labor in the organization of the business; (3) the better mechanical equipment which large firms can afford to buy because they can spread the cost over more business; (4) cheaper power arising from the fact that power can usually be produced more cheaply per unit when produced in large quantities; (5) better utilization of waste, either through selling it in large quantities, or through the development of by-products; (6) the regulation of production by running some plants to full capacity, which is generally economical, and closing down other plants in seasons of short demand; (7) the maintenance of scientific laboratories leading to continual improvements in methods and processes.

[1] Adapted by permission from L. C. Marshall and L. S. Lyon, *Our Economic Organization*, pp. 250–64. (The Macmillan Company, 1921.)

A second group of advantages centers about the greater ability of the large concerns to bear risks. [This is discussed in detail in chapter vii.]

The third group of advantages has to do with the market, including both purchasing and selling, and embraces such matters as the following: (1) purchasing over a wide area enables the concentration of purchases in the most favorable market under the most favorable conditions; (2) there is greater probability of regular demand for products when the scope of operations is great, either with respect to the territories involved or to the wide range of commodities; (3) goods may be advertised more effectively, for advertising cost can be spread over a larger number of units of product; (4) lower transportation charges can usually be secured (*a*) by shipment in large quantities, since carload lots have lower rates than less than carload lots, (*b*) by distributing plants in various parts of the country so that the haul to the market will be a short one—this is sometimes called the saving of cross freights; (5) resources are available for the development of distant markets, and this may be highly important from the point of view of spreading indirect cost over more units; (6) through integration, the "market" connections of each unit are secured.

The fourth group of advantages has to do with the administration of the business and includes: (1) the ability of the large concern to pay the amount necessary to secure a high-grade manager; (2) a corresponding ability to secure high-grade men in the subordinate positions, such as purchasing agents, salesmen, labor administrators, etc.; (3) a corresponding ability to employ high-grade technological experts, such as chemists, geologists, and accountants; (4) the ability to reduce the expenses of administration by eliminating some employees, for example, when integration eliminates the purchasing and sales agents who formerly made connections between two of the units or processes which are integrated.

In spite of all these advantages the small firm still persists in many industries and we have no reason to suppose that it is fated to disappear. Its hold is particularly strong where either the raw materials or the processes concerned are not capable of standardization, for large-scale industry necessarily depends upon standardization and routine. It has a firm grip also in those industries where varying individual tastes of consumers must be met; or wherever the personal relation between buyer and seller is highly important. In producing

"fitted" clothes, fine rugs, elaborately bound books, high-grade furniture, and all forms of art work, the small business unit continues to hold its own. Then, too, many small firms grow up as satellites of large plants. On the flanks of the great packing houses, for instance, are a swarm of smaller concerns that thrive by making repairs, building means of conveyance, using surplus by-product materials, and in other ways making themselves complementary to the larger concerns.

Even in the fields which we have come to consider particularly appropriate to "big business" the small firm has by no means disappeared. Sometimes it is favored by public opinion, and thus, through its customers rallying to its support, secures stability of demand. It always possesses the advantage of having its management in more intimate and personal touch with detail than can ever be the case with the large business unit; its employees are likely to take a keener and more intelligent interest in its affairs than will the employees of the routinized large-scale businesses.

The size of maximum efficiency of a business unit may or may not be reached before it practically controls its field and is thus called a monopoly. What is the size of maximum efficiency in modern business? There is no definite answer. It varies from time to time and from industry to industry. It depends upon the technique of production, upon the market and the administration of the market, upon the technique of business administration, and all these factors reach far back into the general social environment. There is, therefore, no fixed goal with respect to the size of maximum efficiency. The goal has been up to this time a rapidly changing one.

See also p. 745. Some Methods of Concentration of Control.
p. 705. Relative Importance of the Main Forms of the Business Unit.
p. 602. The Control of Large *vs.* Small Scale Industries.

E. STANDARDIZATION IN MANUFACTURING[1]

At its best, as set forth by Mr. Taylor and as realized in practice, scientific management means a thoroughgoing improvement and standardization of the material equipment and productive organization of the plant before an attempt is made to apply its peculiar

[1] Taken by permission from R. F. Hoxie, *Scientific Management and Labor*, pp. 21, 22. (D. Appleton and Company, 1916.)

methods and devices to the determination of standards of labor efficiency and wage payments. It means, thus, the installation of the best available machinery and tools so far as compatible with economy, or at least the overhauling and improvement of the existing equipment; the careful study of the materials of production and the determination of the speed and feed of the machines calculated under the circumstances to be most effective; the rearrangement of the material equipment so as to avoid the delays and expense of unnecessary carriage of materials and partly finished product, and to secure so far as possible continuous straight-line production; the introduction of known and new devices for economical and expeditious handling of materials and product; the careful study and analysis of the detailed processes and methods of production looking to the elimination of waste motions; the improvement of accessories, and the most effective application of force and co-ordination of effort; the reorganization of the managerial staff with a view to avoiding so far as possible multiplicity of duties and to securing definiteness of function and responsibility and, therefore, managerial efficiency in every detail; the improvement of the methods of record-keeping and accounting so that exact knowledge may be had at all times of available equipment and materials on hand, their disposition, actual and prospective, that the productive needs of the concern may be met without friction or delay; reorganization of the sales and purchasing departments with a view to broadening and stabilizing the market for the product, and purchase by specification at the most economical rates and in accordance with needs; improvements in the methods of stores-keeping which insure sufficiency of stock on hand, quick delivery, and avoidance of interest and loss on superfluous and unusable stock; better methods of tool storage, care, and delivery; and many other material and organic improvements, all possible, theoretically precedent to and quite apart from the setting of new tasks; the introduction of new modes of payment or the alteration in general of labor conditions and relationships.

See also p. 838. Standardization.

B. Manufacturing Functions with Particular Reference to Control

Our study of the preceding section has shown us something of the background, and a bit of the spirit, of modern producing activities. Production, more than any other division of business activity, has

fallen under the influence of science. We rely upon technology to a far greater extent than have any peoples of the past to aid us in "our struggle with nature."

In this present section we are to survey the control activities and problems involved in modern production as conducted in a manufacturing plant. Since an introductory survey may deal more appropriately with similarities than with differences, we shall study these activities and problems in a somewhat abstract and generalized way and shall avoid the detail that would be involved in working through specific manufacturing industries. We may properly omit much of the material presented in the orthodox manuals of production since such matters as location, plant construction, control of personnel, form of the business unit, and type of organization are no more connected with production than they are with other business functions. We shall confine our attention to the problems most directly concerned with the *control* of production, with the control of those activities having to do with "the creation of form utility."

We begin (Selection 6) with an illustration of what is involved in modern manufacturing. It is, of course, an illustration in one field only and our minds should reach out to secure an appreciation of what is involved in other fields. The sampling method is continued (Selection 7) by using "layout and routing" to illustrate the control problem in manufacturing. Selection 8 reminds us that this control problem varies with different types of industry, and Selection 9 shows us that, no matter what the type of industry may be, there are certain basic functions always present. Selection 10 gives us a sample of the problems arising in the equipment function.

We turn then (Selections 11–17) to some samples of the measuring and communicating aids of control which the production manager may use. Our interest in these aids is not primarily in their "how it is done." We are more concerned with their "what" and "why." Selection 17 takes up certain aspects of the control problem with particular reference to the scale of operations and the section closes with the presentation of a few organization charts of producing businesses.

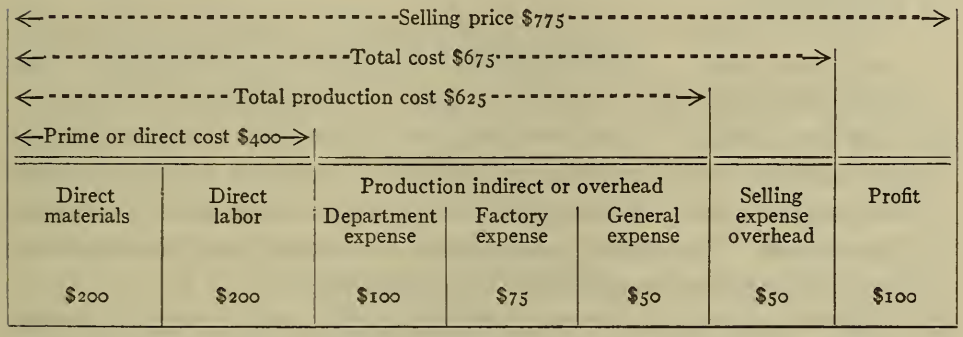
PROBLEMS

1. Selection 6 shows what is involved in modern manufacturing in the case of preparing to manufacture a certain new product. How many of those issues apply to preparation for the manufacture of an established product?

2. Should layout and routing problems be considered in planning an office? a farm? a kitchen? Make a list of the factors involved in an appropriate layout of an office. Might fire aisles enter into the calculation?
3. "A modern factory on mass production is like a river, the various elements flowing like tributaries from the different departments and merging smoothly into the stream of finished product." What are the cost consequences of a failure of one department to perform? Does the quotation show you the significance of progress records, control boards, and pre-planning?
4. A writer says that ideally one should put up a factory building just to inclose properly arranged processing. What does he mean? He also says this ideal can seldom be carried out. Why not?
5. What are the different types of manufacturing industry? Give illustrations showing how the control problem varies with the different types.
6. "Variety creates expense and quantity creates income." Explain.
7. Compare Selection 9 with 6. Is the word "design" used in the same sense in the two selections? Do you know the meaning of "planning," "design," "dispatching," "control board"?
8. A manager is considering the substitution of a newly invented machine for his present ones in a given production department. What issues does this raise in your mind?
9. What arguments can you give for a separate toolroom under the control of a separate functionary?
10. Draw up a list of the wastes that are likely to be present when a business has expanded its buildings without having had from the very beginning some plan of expansion.
11. "There is just one rule for constructing a building to house production and that is, employ a good architect." Comment.
12. It has been urged that manufactures of machinery would do well to issue time-study material in connection with their sales literature. Why or why not?
13. What objections are there to having the foreman do the inspecting? Do you think that he should have no duties in this field?
14. "The price of a rigid system of inspection must not be a loss of good will." Explain.
15. What are the gains coming from graphic schemes of control?
16. In what types of industry are progress charts particularly useful?
17. Just what is motion study designed to accomplish as a control instrument? time study? Compare the usefulness of "unit" time studies and "over-all" time studies.
18. What steps are prerequisite to the making of a time study for purposes of task setting?
19. What is to your mind the outstanding argument for classification? for symbols? Do you gather that they are useful to the manager

only in the field of production? In production, in what types of industry are they most helpful?

20. What arguments can you see in favor of symbols composed of letters rather than numbers?
21. One writer gives the following list of possible items of indirect cost: Indirect material; oil; supplies; freight and express inward, when not charged to direct material cost; indirect labor; supervision; inspection; experimental; rent; taxes; insurance; interest; depreciation; maintenance; repairs; power or power plant; light; heat; small tools; wastes of material, shrinkage of weight, defective work. Can you cite any items of direct cost?
22. Take the following arbitrary case of the cost and price of a single unit of a certain commodity:



Direct materials	Direct labor	Production indirect or overhead			Selling expense overhead	Profit
		Department expense	Factory expense	General expense		
$200	$200	$100	$75	$50	$50	$100

How could one know that $100 department expense should be assigned to this unit? $50 selling expense? Is cost accounting needed in marketing operations?

23. "An outstanding need of any manufacturing plant is accurate costs." Why? Can costs be predetermined? Would anything be gained by having them predetermined?
24. Precisely what is Gantt's point (p. 600) concerning idle machines and cost?
25. One writer classifies the wastes in manufacturing as follows:
    1. Material waste
       a) Raw material
       b) Finished material
    2. Time waste
       a) Direct time waste
       b) Efficiency waste
    3. Miscellaneous waste

    Put as much content as you can into this outline. Do you know how the wastes you cite can be eliminated?
26. "Cost accounting is a thing quite different from proprietorship accounting." Explain. Does this mean that a producing concern must keep separate and distinct accounting systems for the two purposes?

27 Draw up a list of factors making for a small scale of production. Speaking in generalizations, what factors enter into the determination of "the size of maximum efficiency" in a business?

28. In the case of a concern which is the result of a combination of several (formerly) competing concerns, what are the relative merits of central *vs.* local administration? How would it do to have centralization of policy formation and decentralization of management? Is the solution so simple?

29. Tabulate the savings resulting from standardization of machines; of products. Why have we not gone farther than we have in standardization of these items?

30. This is sometimes called the era of interchangeable parts. Does this presuppose standardization? Does it affect the control problem in production?

31. Taylor, after years of experimentation, drew up rules concerning tension and care of belts. He did the same in the field of metal-cutting. Were these contributions to production *control?* Be specific in your answer.

32. Can you imagine a factory having the exact work of each machine planned out for each working minute for the next day? the next week? the next month? Is the problem related to the work of the sales department? the finance department? In what types of industry is such pre-planning most difficult to accomplish?

33. "Specialization really covers two ideas as the word is used in modern industry. The first idea is differentiation and the second is co-ordination of the differentiated elements." What is differentiated? Is it labor, or capital, or management, or plants, or territories? Is control of industry concerned only with that aspect of specialization which is here called co-ordination?

34. Some managers object to having an organization chart made out for their organization on the ground that it will result in inefficient control. How can they argue this? What arguments can you advance for having an organization chart on the wall?

6. AN ILLUSTRATION OF WHAT IS INVOLVED IN MODERN MANUFACTURING[1]

As a practical illustration of what the modern system of manufacturing consists of and how it is installed and carried on, I will take up the various arts called into use and necessary to the successful

[1] Adapted by permission from J. V. Woodworth, *American Tool Making and Interchangeable Manufacturing*, pp. 23–26. (The Norman W. Henley Publishing Company, 1911.)

constructing and placing on the market of a machine for which there is a large demand.

After the developing and experimenting has reached a successful conclusion in a perfect working model, the first thing necessary is the designing and making of full sets of wood and metal patterns, to be used for casting the various parts which are to be cast. The man who does this must call into play a vast amount of ability and knowledge in order to accomplish this part of the work. He must allow of all parts being sufficiently strong, so that the castings resulting will withstand all strain to which they may be subjected when in use, and he must provide for giving them, as far as possible, a symmetrical and artistic appearance. He must also allow for shrinkage in the metal when cast and for a certain amount of surplus stock at all points which are to be machined and finished.

After the pattern-maker has produced these patterns in exact duplication of the designs, they are sent to the foundry, where the moulder utilizes his skill and brains, and, with the patterns as models, a heap of sand and a few crude tools to work with, works out his moulds, from which a set of castings are produced. This set is first machined and finished by the use of the best means available, which calls into use all the capacity and skill of the machinist. After all parts have been finished and assembled, a finished machine is the result. Any defects in shape or strength in the patterns have now become apparent in the finished castings and the parts. The patterns are then carefully gone over and these defects rectified, and another set cast from them. This set is also finished and machined, and then assembled in another machine. This latter machine is found to be a great improvement over the first, as all defects and inaccuracies have been rectified and each and every part has been machined as accurately as possible.

The machine now goes to the tool-designer, who is called upon to scheme up and design complete sets of tools, dies, fixtures, and appliances for the machining of all castings in repetition and for the exact duplication of each and every other part, from the largest shaft and gear to the smallest pin and screw. To be capable of accomplishing all this the designer must be—first of all—a practical man, familiar with all mechanical principles necessary to the successful construction of the tools, as well as be possessed of a theoretical knowledge of the properties of all metals. He must design the tools to be both positive and accurate, as well as strong and durable. He must also allow of

their being constructed as simple as possible, consistent with accurate production and rapid handling when in operation. He must, lastly be certain he is right in all measurements down to the smallest fraction of an inch. In fact, he must construct a perfect set of tools for the exact duplication of all the parts of the machine on paper. The designer must also provide for the tools being so constructed as to allow of being handled and operated to their fullest capacity by men of the average skill and intelligence, with rapidity and without the possibility of error. By the time the designer has accomplished all this and gone over and verified all his designs, until he is sure of their accuracy and of their coinciding perfectly where necessary, he has finished his part of the work.

The tool designs and the machine now go to the tool-maker; he has the last, but not least, proposition to tackle. Where the pattern-maker had to produce his designs in wood, the draughtsman his on paper, and the moulder his in sand, the tool-maker has to create his in steel and iron, which can neither be whittled with a knife, nor the parts fastened together with glue, nor the mistakes and inaccuracies rubbed out with an eraser. Neither can the tool-maker shape his work in sand and locate the points with a trowel. He is the man on whom the accuracy, efficiency, and working qualities of the finished product depend. His skill, ingenuity, and powers of creation and production are taxed to their fullest extent indeed; and, unless he is a man of brains, skill, and experience, all work of the designer, pattern-maker, and moulder will have been useless. First in the machining and finishing of the tools and the placing of all locating points, and then in the assembling of the parts, is his knowledge and skill called into play. As each tool, fixture, or device for the production of some special and distinct part is finished, it must be tried and proved; and the piece machined in it must fit exactly in its proper position and coincide perfectly with all other points necessary in the other parts, so that the performance of its separate and distinct motion will be guaranteed. And thus on to the end of the list, until the full set of tools is complete, so that a perfect and complete machine can be constructed by their use, with the certainty that all parts machined in them will be found to interchange perfectly, so that they may be selected haphazard in the assembling of a new machine or in the repairing of an old one. When all the foregoing has been accomplished, the preliminary work necessary to the successful manufacture and perfect operating of the machines in any number desired, with the

certainty that each and every one will be an exact duplicate of the others, from the smallest pin or screw to the largest casting, is an accomplished fact. We may now go ahead and manufacture by means of the interchangeable system, which allows of the construction of machinery at the minimum of cost and to the maximum of production; and, what is more, allows of constructing machines in exact duplication of each other, which could not be accomplished by any other means.

7. THE CONTROL PROBLEM ILLUSTRATED BY LAYOUT AND ROUTING[1]

It is quite apparent that our manufacturing methods may be divided into continuous and intermittent processes. In continuous processes the material goes in at the receiving end of the plant, is worked continuously, and appears at the shipping-room as finished product. In intermittent or interrupted processes, various materials may be worked to varying stages of completion and stored away, the machinery working on one article today and another tomorrow and assembly into finished products being carried on as is found necessary.

Buildings are more easily adapted to fit the needs of continuous processes than to those of any other. Sugar refineries, flour mills, steel-rail mills and packing-houses are examples of continuous industries where buildings often are closely adapted to the needs of the industry, and may often be so closely adapted as to be useless for any other purpose. At the other extreme are many industries that consist principally of assembling operations, little machinery being employed, and that of small size, the entire business consisting of small self-contained production centers. Floor space is the principal requirement and, within limits, the building may be any shape. In some of these industries the density of the workers is almost the only limiting factor, so much so that legal restrictions are in force in many states to regulate the congestion possible in these callings. Between these extremes come all manner of manufacturing processes, each presenting a different combination of needs.

The construction of a building perfectly adapted to a given industry presupposes a perfect knowledge of the character and capacity

[1] Adapted by permission from D. S. Kimball, *Principles of Industrial Organization*, pp. 234–42. (McGraw-Hill Book Company, 1913.)

of the several machines or processes to be used and the logical arrangement that must be made with them so as to carry the material through the plant most economically. In continuous processes this information is comparatively easy to obtain since the capacity of each machine or set of machines devoted to any part of the work must bear a definite relation to other machines or groups of machines, or the other factors of the process; and the nature of the process usually dictates the natural sequence of operations, or suggests such handling or conveying devices as may be needed to keep the process continuous. In other extreme cases, where assembling is the predominating factor, the problem is still easier; since here sequence is not a factor, the production units are small and the output a computable quantity. In intermittent manufacturing, however, this problem is often most difficult and always deserves more consideration than is usually accorded to it, not only in securing a *balanced* equipment but also to obtain any approach to a *flow* of material through the plant with a minimum of transportation expense. Obviously, here also no definite rules or method can be evolved for solving such problems, but there are certain general principles that apply to all plants and which may be worth noting.

When the equipment of each department has been selected, with the foregoing considerations in mind, the internal arrangement of each department can be completed tentatively, at least, due consideration being given to transportation, storage, power, etc. The floor space so determined can be compared with similar departments if such data are obtainable.

With the equipment of the several departments selected and tentatively arranged it will remain to arrange the several departments with reference to each other so that the material will pass through the plant with a minimum amount of traveling and handling, and so that the factory shall work smoothly as a whole. This conception of the plant itself as a *machine* is a helpful one. There are many existing factories where a careful analysis and rearrangement of the plant along the lines suggested would work wonders.

The ideal sequence is obtained in some continuous processes, the building following the sequences naturally or the two being mutually adapted to each other. It is obvious that no such sequence or adaptation of building can be secured in the average case of intermittent production, many compromises usually being necessary. The general principle, however, should be applied as far as possible,

particularly if a well-developed planning and routing department is proposed. This is true, not only of factories housed entirely in one building, but also of large plants occupying many buildings, with the added consideration of proper yard room and perhaps railroad connections.

If the plant under consideration is a new one, care should be taken to provide ample facilities for additions and extensions in such a manner that the equipment may be kept balanced without serious rearrangement. Thus, extension can be made without changing the original plan of the works. An ideal building plan is one built on some "unit" system, like a sectional bookcase so that additional units can be added at any time without disturbing the manufacturing system and organization. A little forehanded planning of this kind will often save large sums when additions or extensions are necessary.

See also p. 844. The Range of Time and Motion Study.

8. THE CONTROL PROBLEM VARIES WITH DIFFERENT TYPES OF INDUSTRY

A[1]

In manufacturing, if we separate work into different types, we are apt to classify them on the basis of the material or of the product. *The broader plan—the plan in accord with modern principles of management—is to consider in the same type those in which the fundamental principles of treatment are alike.*

Every plant presents the necessity for all the principles I have indicated, but the principles vary as to relative prominence in different plants. Considered from the point of view of method of attack and manner of treatment, industrial plants may be considered in three groups in which variously predominate: (1) scientific research, required for a plant where the production is handled as a whole by a continuous flow, as in a paper mill or in a pulp mill, or a cement mill, and where the principal study must be devoted to standardization of methods and improvement in quality; (2) planning and routing, required as the first essential where, as in a printing shop or a shop manufacturing miscellaneous but standard products with independent

[1] Adapted by permission from S. E. Thompson, "Scientific Methods of Management Applied to Various Types of Industry," *Bulletin of the Taylor Society*, II (1916), 2–5.

machines, these also involving much detail because of small orders or numerous parts; (3) analysis and detail instruction required as the chief essential, such as in a machine shop, along with complex planning and routing.

To illustrate what I mean by this grouping into types, I will take as an example two manufactories in which at first thought the industrial conditions are absolutely different, with no similar problems. At first thought, we would say that a plant making Portland cement is of a type as different as possible from a mill making paper. On the contrary (and in selecting these two examples, I am taking two processes which I know a little about) the two are essentially alike in type of management. I mean by this that the character of the problems involved when viewed from the standpoint of the scientific method is the same, and similar principles of operation are required. In making this statement, I understand fully that the experience of a paper mill superintendent does not fit him for managing a cement mill. A cement mill manager, on the other hand, would be at sea in a paper mill.

But let us consider the fundamental principles for a moment. In the paper mill, there are two chief raw materials, rags and pulp; in the cement mill there are two chief raw materials, one consisting essentially of limestone, and another consisting essentially of clay, or aluminous rock. In both cases, after certain preliminary treatment, the two raw materials go together, and then following a continuous process, not touched by hand until the product comes out in the one case at the end of the paper machine to the storehouse, and in the other case, from the grinders to the storage bins. The likeness is not merely superficial. In both products, quality is the chief aim and scientific research is necessary to determine the best way of attaining and retaining quality. In both, the character of the raw materials varies, and must be allowed for. In both the aim is to so mix these varying raw materials as to produce the product of required quality. In both the operation of the principal machines, in the one case, the beating engine, and in the other case, the kilns, are controlled, under ordinary methods of management, largely by judgment. In both processes, the manufacturer usually works backward, from the quality of the finished product to the raw material, and makes changes after having gotten the results from a previous run.

I wish I had the time at my disposal to indicate more in detail, the special features required for different classes of industry.

In the machine shop features requiring special attention and producing results are standardization of tools and machines, routing and instruction cards.

In the bank, the chief item may be the development of the personnel and the establishment of standard methods.

In the pulp mill it may be a matter of research to determine the raw material and the methods that will produce uniformity.

In the paper mill, it may be the standardization of the furnish and the handling of the beating engine.

In the textile mill, it may be the classification of the raw material and the routing to the different frames and in the spinning room the systematizing of the doffing.

In the shop manufacturing a standard product, it may be the investigation of methods to produce quantity and quality.

In the construction work, it may be the ordering of materials, the systematic distribution, the training to the right method.

B[1]

The relation of the *variety* of product to the *quantity* produced, so influences the art of manufacture and especially those branches dealing chiefly with arrangement of machinery and control of material in its processes through machinery, that it may prove of some assistance to the manager confronted with this problem if it be briefly discussed.

Except as somewhat modified by highly standardized products repetitively manufactured, or when variety of design is the chief product for sale, *variety* creates expense, and *quantity* creates income. Therefore, in manufacture, the ratio of variety to quantity should be maintained as low as possible, consistent with the requirements for operation and service rendered by the product. In variety must also be included alterations to existing designs.

Variety and quantity are related in manufacture in three principal forms of complexity:

a) As finished groups composed of a variety of parts in varying quantities assembled in standard arrangement. This group is typified by chemical compounds, automotive mechanisms, and printing machinery.

[1] Adapted by permission from G. D. Babcock, "Influence of Variety, Quantity and Complexity of Product in Manufacturing Control," *Industrial Management*, LXI (1921), 272–73.

b) As finished single items made from one material or mixture and disposed of unassembled, typified by forge and foundry products, spare parts for mechanisms and coinage.

c) As finished single parts or assemblies obtained through disassembly of complex mixtures or compounds, typified by chemical elements, corn or other grain, packing house and coal tar products, and oil refining.

Obviously all sorts of combinations of these principal classes occur in any single factory, but it is noticeable that its major product usually falls within one of them. These three forms of complexity indicate widely varying requirements in manufacturing management and methods for control.

In the first (*a*) class (complex assembly) no part of the product is salable. The number of finished units for sale is usually small for given investment. The variety and quantity of parts in each finished unit is fixed. The period of time required for production is usually long. The variety of mechanical and other processes is usually large and calls for a varied training in the operating personnel. Any adjustment in the rate of output of the finished unit necessitates readjustment in the rate of production of each element of the work.

This is truly a complex problem. There is no simple plan which can be applied for its control. Either the number of units produced must be so large that each producer works constantly on one operation, or centralized planning or daily conference of supervisors to co-ordinate the effort must be provided. Either planning or conference is expensive, but the minimum investment is so large, and the chances for irregular delivery so great, that some intensive plan must be applied and thus prevent the manufacturing effort from "running wild."

Of the two methods of supervision, the central planning for all activities is rapidly supplanting daily conferences. In central planning, standards are required. These standards may be established opinions of the members of the executive staff, applied, whenever occasion demands, by the planning group. Even if these standards are but temporary, better and less costly results are usually obtained by planning. In times of emergency affecting established standards, or in the control of a product which is continually varying, nothing will substitute for the conference.

In the second (*b*) class (or a simple product) each part is salable. Any variation in manufacture or sale of one part does not seriously disarrange the plans for another. There is no fixed relation of the

parts in complex arrangement. The period of manufacturing time is usually short. The quantity of each item is usually large.

Central planning is much simplified and exact control of output more easily obtained. If the quantity be increased to large amount, the requirements for central planning will decrease and somewhat change in form as in that of a complex product. Complexity will invariably decrease if variety is constant and quantity increases.

There is, however, one particular problem in the manufacture of this class of product. The rate of demand for various parts is subject to frequent and large fluctuation. The anticipation of rate of demand and the control of stocks, both finished and raw, to deliver orders on time without excessive inventories, taxes to the extreme the most able planning group.

In the third (*c*) class (disassembly of complex material) new planning problems enter. Neither the variety nor quantity of elements remain exactly constant in the base material. They occur, however, in a proportion so nearly constant as to worry the management in the profitable disposal of those elements for which the demand is light, but which must be produced in obtaining those for which the demand is heavy. By-products occur in this class of manufacture, as it seeks to produce one or more of the single elements. A by-product may become a main product as uses and markets are developed. There is usually some useless residue from the original material or from that which is introduced in its refinement. The high order to which this class of manufacture has reached is shown in the packing industry.

Although the quantities of each element planned for in this class are not constant, the probability of fairly uniform returns is sufficient to provide for approximate standards. The beneficial results secured in planning for a complex product can be likewise obtained for this class. This product by its nature has a large influence in manufacturing control, and calls into intensive play more members of the organization than does any other class. Production, storage, sales, distribution, and finance are all much affected.

Through our various sources of study and of educational enlightenment, practically all of the problems entering into the art of manufacture have been solved and are matters of record. The elements used in planning management are well established and limited in number. It is the work of combining these elements into methods fitting the problem that is most subject to error. It is errors of this sort, especially with regard to variety and quantity of parts and complexity of their grouping made by inexperienced or incapable

consultants or employees, which has until recently delayed its general adoption.

See also p. 778. There Is No Single Correct Form of Organization.

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9. FIVE ORGANIC FUNCTIONS IN MANUFACTURING INDUSTRY[1]

[The preceding selections have served to indicate the great range of control problems in modern manufacturing. If the mind is to really grasp these problems some system of classification must be used. The following selection will be found to justify careful reading and re-reading precisely because it reduces these problems to groups or classes.]

In a manufacturing industry, according to the writer's examination of the subject, the objective of the whole, namely, production, is realized by a synthesis of five organic functions, which are invariably present in every type of industry, but to very different extent in each, just as an army may require a great development of transport or it may not. These five organic functions are design, equipment, control, comparison, and operation.

DESIGN

Taking the first of these organic functions into consideration—that of design—it will be obvious that this must exist in every industry, but in a very different degree of development in some compared with others. In a chemical industry, for example, it exists in a very elementary form, that of a mere formula of mixture. In an electric manufacturing or a heavy engineering plant, on the other hand, it exists in the most highly developed state; it demands an elaborate equipment, a large staff, a collection of experts, a close and continuous touch with every detail of life in the shops. But the important point is that both the elementary and the highly developed condition in which we find this function have exactly the same end and aim, namely, that of prescribing in advance the changes which shall successively take place in material.

In its fullest development the function of design covers the following items:

[1] Adapted by permission from A. H. Church, *The Science and Practice of Management*, pp. 28 ff. (The Engineering Magazine Company, 1914.)

1. *The Piece or Other Unit of Manufacture:*

a) *Nature of material.*—May include specification of constitution of material, such as iron, steel, brass, yarns, or other particular materials, and alloys, or other particular kinds of mixtures; and of physical properties, such as hardness, elasticity, elongation, etc.

b) *Shape and dimensions.*—May include specification of margins, allowances, fits, tolerances, and prescribe sizes of sheets or rolls from which the pieces are to be cut and "number out."

c) *Other properties.*—Specification may include the prescription of surface-finish, patterns for markings, color or shade, etc. It may also be concerned with exact quantities, as in chemical manufacture.

2. *The Accessories Peculiar to the Manufacture of the Piece:*

a) *Template, jigs, etc.*—In addition to the design of the unit of product, it may be necessary to design special jigs, templates, or cards, and special machine fixtures.

b) *Tools.*—In some industries it may be desirable to specify the exact tool, drill, broach, reamer, or tap by which the dimensions are to be realized or the special type of cutter or other standard accessory to be used on the jobs. This is chiefly for the purpose of securing accuracy and saving time in the operation department.

c) *Special rigging.*—It is sometimes necessary to design temporary devices for handling unusually bulky, heavy, or awkward pieces.

d) *Machines.*—In some cases the new product may demand a novel kind of machine, or a reconstruction of an old one, which has then to be designed specially.

3. *The Details of Operation:*

a) **The method.*—May include specification of the particular machines to be used, and their speeds and feeds, the sequence of operation, the sequence of handling at each operation, etc.

b) **The time.*—May be specified as preparation time and operation time. Details may be carried very far, and time of every motion in extreme cases may be specified.

*These items of specification are necessary in proportion as the science and practice of operation is at a low level, or where, as in some machine shops, there is a great variety of work at each machine. In proportion as the scope of machines is limited, i.e., where they can only do one thing at one speed, in one way, the necessity for this class of detail disappears. In some industries there is almost no room for it.

See also p. 560. An Illustration of What Is Involved in Modern Manufacturing.

p. 624. Control of Manufacture under the Taylor System.

EQUIPMENT

Again, the nature of the equipment and the method of its employment may be entirely different in a paper mill, a foundry, and a soap factory; but yet each must have equipment, and in each certain laws as to the use of such equipment must be observed in the same way. In each there will be a layout more efficient than any other, in each there will be decay and replacement of equipment, depreciation, maintenance and repair, etc., quite irrespective of the kind of equipment or its uses. On the other hand, the lay-out of equipment will be much more important in some industries than in others. Product that can be pumped through pipes, or conveyed on endless bands, is much more independent of physical lay-out than one which demands great effort to move it even a short distance. Every variety of equipment will have its own problems, but a large number of these problems are common; that is, they differ in degree and not in kind. But in no case is equipment absent altogether.

In its fullest development the function of equipment covers the following matters:

1. *Installation or Engineering Selection:*

a) *Buildings.*—Allotment of different parts of buildings to suitable uses, i.e., the lay-out of departments, installation of appliances for lighting, heating, ventilation, fire protection, etc.

b) *Power plant.*—Selection of the right type of plant, and suitable means of distributing and delivering power where required. Consideration of the margin of power necessary.

c) *Materials.*—Provision of adequate equipment for storage and conveyance of materials. Storage racks, bins, fixtures, cranes, travelers, trucks, conveyors, etc., considered in reference to the volume of work and lines of travel.

d) *Machinery.*—Provision and installation of machinery and design of lay-out in relation to travel of product.

2. *Maintenance or Administrative Use:*

a) *Buildings.*—Repair and maintenance of structures, maintaining an adequate service of light, heat, ventilation, and fire organization. Keeping premises clean and bright.

b) *Power.*—Keeping up supply of power in right quantity, during right period, on an economic basis. Attending to storage of fuel against contingencies, oiling shafts, maintaining belts, and so forth.

c) Machinery and appliances.—Repairing and maintaining all kinds of equipment in working order.

See also p. 76. The Interdependence of Construction and Equipment with Site Location.
p. 578. A Sample of Problems Arising in Manufacturing Functions.

CONTROL

The function of control is also obviously common to all manufacturing plants. Broadly stated, it is the function of the "boss." But as the boss cannot subdivide himself, and cannot attend to all the matters necessitating control, this function requires more or less development according to the industry. In some, such as continuous industries where product is subject to a fixed and unvarying sequence of manipulations wholly conditioned by the nature of the machinery employed, control does not need great elaboration. In other industries, such as engineering manufacture, the multiplicity of processes and parts, the necessity of storing, handling, and moving innumerable articles of product, the importance of taking care of the element of delay, the necessity to co-ordinate instructions and material so that one does not have to wait for another, means a high degree of elaboration of the function of control, and it is consequently this function that commonly gets over-organized and smothered under folds of red tape. But no industry exists in which control does not need intelligent organization on its own merits.

In its fullest development the function of control covers the following matters:

1. *Installation of Control—The Delimitation of Duties:*

a) Within the other organic functions.—Commencing with the heads of departments, i.e., the men who are in charge of the organic functions of design, operation, equipment, and comparison, it plans their duties, decides what subordinates they should have, and what specific duties these subordinates should fulfil. It therefore plans the interior structure of the systems by which these functions are exercised.

b) In its own special department.—It plans the relations between the above departments, and says which persons shall confer, and when. It arranges all the specially administrative duties, such as ordering, receiving or storing material; receiving customers' orders and passing them to the various departments concerned; supervising

the current work of all departments, in the light of costs, wastes, delays, poor work, and other irregularities. It arranges all this by planning specific duties for specific persons, including the organization of specialists' advice or "staff" assistance.

2. *Administrative Function of Control—Supervising, Ordering, Instructing, and Training:*

a) *Within the other organic functions.*—Once organized under a head, each function is to a great extent autonomous. In other words, control of the departments of design, operation, equipment, and comparison is exercised through the heads of these departments, who are responsible for seeing that their subordinates are carrying out their duties as planned originally.

b) *In its own special department.*—Administratively speaking, control is the great co-ordinative function. It sets everything in motion by issuing orders. Its particular task is to issue orders in such a way that, when all have been carried out, the result is exactly what was intended. It also observes failures, studies their reasons, and sets in motion the mechanism of instruction or training to prevent similar failures in the future.

See also pp. 581–602. Measuring and Communicating Aids.
p. 624. Control of Manufacture under the Taylor System.
p. 149. Education and Training.

COMPARISON

Similarly, there is no industry in which the function of comparison does not exist. In "continuous" industries, where what is being done today at twelve o'clock will be done tomorrow at the same hour, comparison is at its lowest development, though even here there are often analyses to make, temperatures to watch, operatives' attendance to check and so forth. For comparison deals with the record of quantities, whether such quantities are expressed in time, money, degrees, levels, or other notation. It therefore includes *testing*, *inspecting*, and *cost accounting*. Any data which are of significance at all are only so by comparison. This comparison may be with previous or future work of the same kind, or it may be with standards. And such standards, again, may be specified standard set up by design, such as limits, fits, or dimensions, or may be comparisons between time allowed for a job, and time taken, or may deal with physical standards such as temperatures, pressures, degrees of vacuum, specific gravity, and so forth. But

all these cases postulate two things: (1) the observation and record; (2) something by which to judge the value of the observation and record. No industry is without need for some of these methods of comparison, while in many industries a very considerable development of the function is both proper and profitable.

In its fullest development the function of comparison covers the following matters:

1. *Technical Sphere of Comparison:*

a) *Chemical analysis.*—Compares the composition of materials with purchase specifications (which are, of course, based on standards) and with the standards specified by design as to use of formulae of mixture. Embraces all comparison other than physical, i.e., all in which the constituent elements of bodies need to be compared with standards.

b) *Physical analysis, or inspection.*—Compares the physical condition of materials which have been purchased or made with the standards specified by purchase or design, such as regards dimensions, color, pattern, surface finish, etc. Carries out physical tests for hardness, elasticity, elongation, tensile strength, etc. Passes on all physical properties not necessitating analysis.

2. *Accounting Sphere of Comparison:*

a) *Time.*—Records results of work of which the efficiency is measured in time, and compares with standards. Thus, attendance of employees, working and idle time of machines, time of operations in which result is dependent on duration, as in some industries, where product is matured, seasoned, etc.

b) *Quantity and number.*—Records fluctuations which are expressed in quantity or number, such as quantity of material in stock, consumption of tons of fuel in proportion to pounds of steam raised, number of employees present and absent, weight of components passing into a mixture, etc., and compares these figures with standards.

c) *Value.*—This is the sphere of cost accounting. Records the cost of labor, expense, and material, as and when incurred and used, and compares with standards. Classifies the results of work as utilized capacity and waste. Groups labor, expense, and material so that the cost of jobs is ascertained and compared with expected or standard cost of such job.

See also p. 370. Measuring Aids: Testing in Connection with Purchasing.
p. 581. Measuring and Communicating Aids: Inspection.
p. 595. Measuring and Communicating Aids: Cost Accounting.

OPERATION

The final organic function found in manufacturing is that of operation. This comprises the exercise of manual skills, trades, and callings, usually by way of operating machines, but not necessarily so. Just as the prime organic function of an army is the fighting corps, so the prime organic function of a plant is that of operation. Just as a transport corps will not win battles, though it may lose them; so the organic functions of design, equipment, control, and comparison will not make an ounce of product, however well arranged, though if badly arranged they may lose the battle of competition very easily indeed. Operation is definable as the act of changing the status (that is, the form, dimension, or composition) of material in accordance with the specification of design. In practical language it is the work of the shops, but only the operative work of the shops. It does not include foremanship, which is part of control; or inspection, which is part of comparison. It goes without saying that operation is a function present in every plant of every kind.

In its fullest development the function of operation covers the following matters:

1. *The units of operation.*—Operation is the synthesis of a number of separate trades, skills, and processes. Usually, but not always, these are exercised through the operation of machines. In most modern industries machines occupy nearly the whole field, and such hand skill as remains is usually in the nature of producing greater refinement of finish than machines can be made to give. Every distinct skill or machine process is a unit of operation. Operation itself depends for its efficiency on the application of processes to units of product in accordance with the best technical practice.

2. *Preparation for operation.*—In some industries, whenever product is varied, it becomes necessary to modify, add to, or take away some accessory of the machine. This is termed preparation and should always be reduced as much as possible, as it is a loss to production. It is generally considered to include, also, restoring the machine to normal condition and cleaning up after a job.

3. *Operation.*—Operation is the actual technical work of cutting, pressing, twisting, heating, weaving, mixing, assembling, etc., as performed on the material in accordance with the specifications of design, and by aid of the best technical effort able to be put forth by the operator.

NOTE.—Operation does not include anything but the application of technical skill to transform and transmute material. Therefore it does not include inspection, maintenance, or the handling of product at any other time than when putting it in position for operation and removing it from the machine.

SUCCESSIVE DEVOLUTION OF THE ORGANIC FUNCTIONS OF MANUFACTURING DURING THE RISE OF AN INDUSTRY TOWARD MODERN CONDITIONS

Stage 1. Beginnings of industry.—The craftsman exercises all the manufacturing functions in his own person. (Selling and finance are not included in this discussion.) "The day of small things."

Stage 2. Devolution of operation.—A workman and apprentices are engaged for the manual or operative work. The workman exercises supervision and becomes in course of time a fully fledged foreman. Later he has to devolve some of his duties on other foremen, and is called superintendent. (Once an organic function is separated out, devolution goes on within it.) At this stage the owner looks after everything else, but ceases to do operative work.

Stage 3. Devolution of equipment.—Equipment begins to assume importance. A mechanic is engaged to run the power plant, attend to repairs, and do odd mechanical jobs. Later we see him represented by a "works engineer" with a power staff, a repairs staff, an electrician, etc., on whom these specific tasks have been devolved.

Stage 4. Devolution of design.—The owner finds it necessary to devolve the preparation of designs and drawings, and so engages a designer and frees himself from this function. The designer's work grows and is devolved on subordinates until we may find ultimately a chief engineer, chief draftsman, a production engineer, an experimental staff, etc.

Stage 5. Devolution of comparison.—Up to this point the owner has only guessed at costs, from rough memoranda compiled by himself. He now devolves this work on a cost clerk, who represents the accounting side of comparison. As the business develops, the cost clerk has to devolve details on others, and becomes an accountant, with subordinate pay clerks, time clerks, stores-record clerks, etc. Also the owner ceases to "pass" on each piece of completed work, and devolves this task on an inspector, who represents the technical side of comparison. Later the inspector's work expands until we find a fully developed testing and inspecting department.

NOTE.—At this stage all the activities of administration, exercised by the owner of the business at the beginning, have been devoluted to organic functions

(themselves made up of groups of individuals with specific duties), save and except his personal controlling and supervising work—or, in popular language, his function as "boss." This latter work, however, soon outgrows the possibility of his attending personally to all of it; hence we arrive at:

Stage 6. Internal devolution of control.—Control, which remains vested in the owner of the business, is exercised by means of a regular internal devolution of this function. It begins with the owner himself, who is directly supervising the heads or executives who have been placed in charge of the functions already separated out (as above), and also goes down through the purchasing agent, storekeeper, order department, correspondence office, tracing department, shipping office, and so forth in definite lines of devolution for special duties. Later we find the organization of "staff assistants and advisers, whose expert knowledge is at the service of those requiring it.

NOTE.—The five organic functions are now completely separated and organized and each has its own internal system of devolution, enabling it to fulfil its special purpose. Our discussion of the problem of management as presented in this book ends here. The organization for manufacturing is now complete. But in large businesses the owner (or the board of directors representing the ownership) withdraws still further from actual contact with routine. We then reach:

Stage . Final stage.—The administrative and the determinative elements of management are separated. The former is devolved on a president or general manager, who is personally responsible for the correct working of the five functions of administration. The determinative element is reserved by the directors as their special field. They decide on points of policy.

10. A SAMPLE OF PROBLEMS ARISING IN MANUFACTURING FUNCTIONS[1]

[In a survey course it is not possible to discuss many of the details arising in the five organic functions sketched in Selection 9. That these details are multitudinous may be seen from the following outline treatment of the issues which come up in connection with selecting and installing machines. This is, of course, only one phase of the equipment function. For such discussion as we have been able to give other phases of this function see page 76, The Interdependence of Construction and Equipment with Site Location, and page 374, Purchase and Stores under Unsystematized, Systematized, and Scientific Management.]

[1] Adapted by permission from *Library of Factory Management*, II, 71–75. (A. W. Shaw Company, 1915.)

A. Points to consider when choosing machinery

I. Cost factors

1. Investment
   a) Initial cost of machine
   b) Cost of accessories
   c) Installation
   d) Depreciation
2. Operational
   a) Upkeep and repairs
   b) Supervision
   c) Power
   d) Wages of operator
3. Final
   a) Hourly charge when idle
   b) Hourly charge when running
   c) Normal productions per hour
   d) Unit cost of production

II. Design factors

1. Materials of construction
   a) Kind used for different parts
   b) Distribution of metal
   c) Strength and stability
2. Power
   a) Is it abundant?
   b) How applied?
   c) Is control centralized?
   d) Are heavy parts power-moved?
   e) Is direct motor-mounting provided?
3. Lubrication
   a) Forced? sigh-feeds used?
   b) If not forced, oil holes accessible?
   c) Oil and grease cups on bearings?
   d) Gears inclosed? run in oil baths?
4. Bearings
   a) Ordinary
   b) Ball bearing
   c) Roller bearing
5. Method of chucking work
   a) Ordinary
   b) Magnetic
   c) Air controlled

6. Safety
   a) Machine
   b) Operator
7. Speed changes
   a) Number and ratio
   b) Quickness of change
8. Operation
   a) Friction
   b) Vibration
   c) Ease of feeding and discharging
   d) Self-helping attachments
9. Repairs
   a) Are wearing parts interchangeable?
   b) Accessible, and easily changed?
10. Miscellaneous
   a) Facilities for quick set-up
   b) Other kinds of work possible?
   c) Is it easily movable?
   d) Rigged for use of cutting lubricant
   e) Fit location available?

B. Readjusting production when you instal new machines
   I. Workmen must be taught to
      1. Tend more than one machine
      2. Keep tools in condition
      3. Keep magazine filled, if automatic
      4. Provide sufficient oil supply
      5. Remove parts and clean out chips
      6. Keep close watch on operations
   II. Shop routine must be altered to
      1. Insure ample work ahead at all times
      2. Provide continuous removal of finished product
      3. Give ample facilities of raw stock and finished product
      4. Keep tools always fit and laid out for next job
      5. Permit long runs on each set-up
   III. Business and selling policies must be revised to
      1. Meet new schedules, if such are necessary
      2. Fit change in labor conditions, if extensive
      3. Create new and permanent demand for increase in output
      4. Insure permanent service of the new equipment, if product changes

11. MEASURING AND COMMUNICATING AIDS: INSPECTION[1]

[This selection should be closely connected in your reading with Selection 9. Inspection was there listed as one of the three main elements in *comparison*. This present selection gives a hint of how the discussion of all the functions mentioned in Selection 9 may be elaborated.]

While the necessity of inspection depends to a certain degree upon the nature of the product, it is a question as to just how far, when, and where it pays to inspect—as to whether it pays to inspect each component part minutely, as to how often a part should be inspected, and as to where it should be inspected, in a central inspection department or otherwise.

The possibilities and scope of a system of inspection have enlarged greatly with the development of specialization. While formerly the chief aim of inspection was to prevent the necessity of hand fitting, the adage being that "an ounce of inspection is worth a pound of fitting," an up-to-date inspection system is planned to accomplish a varied number of ends, among which the following are the most frequently sought:

1. To prevent loss in prestige due to non-uniformity or defects in product which may cause accidents or delays.
2. To prevent necessity of hand fitting.
3. To prevent expense of replacing defective parts.
4. To prevent additional labor on parts already spoiled.
5. To prevent acceptance of defective raw material.
6. To pay workmen only for good workmanship.
7. To prevent decrease in quality due to an increase in quantity caused by the introduction of wage systems.
8. To stimulate good workmanship through the moral effect of keeping records of defective workmanship.
9. To point out imperfections in machines and processes as well as in workmanship.
10. To point out proper allowance for unavoidable loss in making cost of price estimates.
11. To point out operations in which the workman must be better educated or instructed.

[1] Adapted by permission from A. D. Wilt, Jr., "The Relation of Inspection to Money-making Shop Management," in *The Engineering Magazine*, XXXII (1907), 725–36.

12. To stimulate good will through fairness in fixing responsibility.

An inspection system may be operated for one or all of these purposes, but it may not always be devised so as to accomplish all of them. The inspection necessary to produce a perfect automobile, adding machine, or cash register may be entirely unnecessary to produce one of the so-called "tonnage" products, such as rolled steel bars or castings, or such products as cloth and leather. But nevertheless the same principles of shop management are involved in every case, and can be applied in varying degrees to any class of manufacture. Upon the degree to which they can be applied—upon the certainty with which several conditions can be satisfied—depends the success of any plan of inspection.

Conditions which must be satisfied before it can be determined how far, when, and where it pays to inspect are as follows:

I. Responsibility must be fixed with certainty.

II. The price of a rigid system of inspection must be not a loss of good will.

III. The authority of an inspector must end when he has passed upon the quality of the work.

It is safe to postulate, at least, that his authority *could* cover the following functions:

1. That of detecting the defect.

2. That of detecting the cause—locating the responsibility.

3. That of prescribing the remedy.

4. That of administering the remedy—of disciplining or instructing the responsible party.

5. That of reporting the defect.

An ideal system of inspection is one which will enable the inspector to express his opinion as to the cause of the defect, and leave the duty of placing the responsibility and disciplining the men to a higher authority.

IV. The responsibility of detecting defects must be placed on the operator as well as on the inspector.

V. Comparative records must be kept of all appreciable rejections.

Many different plans of inspection have been devised which will accomplish some or all of the benefits that have been pointed out. Each plan must depend more or less upon the nature of the product. It would be impracticable to rely entirely upon a plan of centralized inspection in the manufacture of boilers or safes, but as many of such large products contain some small parts, it might pay to have both

central and local inspection. It is therefore impossible to recommend any one particular plan for all classes of manufacture, so only the particular features of the plans in most general use will be pointed out.

Most of the plans of inspection are variations of one or more of the following:

1. Local inspection by traveling inspectors.
2. Local inspection by foremen.
3. Departmental inspection departments independent of department foremen.
4. The centralized inspection department.
5. The "chain" plan of inspection.

1. *The plan of local inspection by traveling inspectors.*—The distinguishing principle of this plan is that each production center is visited by a traveling inspector. Either this plan, or that of having local inspection by foremen, is essential in the manufacture of large products which cannot be readily transported.

2. *The plan of local inspection by foremen.*—Some manufacturers have attempted to secure the benefits of traveling inspection by placing the whole duty of inspecting upon the foreman. This is practically the same principle as setting a thief to catch a thief, for as a foreman is partly responsible for the spoiled work in his department, it naturally is not to his interest to report all defective work. The many duties of a foreman generally prohibit his assuming the direct responsibility of inspecting, so sometimes the plan is adopted of having a small inspection department in each department.

3. *Departmental inspection departments independent of department foreman.*—The inspector in this plan is generally not under the department foreman. The stock is inspected and counted just before it leaves the department. In this way the responsibility is fixed with quite a degree of certainty and celerity, and it is practical to have the duty of inspector end when he has located the defects. Its chief drawbacks lie in the difficulty of preventing collusion between the inspector and foreman.

4. *The plan of centralized inspection.*—It has become almost an axiom in factory management that the greater the centralization or specialization, the less is the cost of manufacture. While this does not necessarily follow in all cases, I have become convinced that it pays in the function of inspection. It pays because but one skilled inspector is necessary, for an inferior grade of labor can be employed to do the routine inspection, owing to the fact that the responsibility

of the inspectors is narrowed down to the simple duty of detecting and reporting defects. The chance for partiality is reduced to a minimum, and consequently the chance for ill will, owing to the isolation of the inspection department from all other departments.

The chief claims for merit in this plan are its economy, its security from collusion, and the surety with which it supplies reliable records of all rejections.

5. *The chain plan of inspection.*—The "chain" plan is practical only in the manufacture of such products as will permit of a sequence of operations in one department. The plan is to have the last man in the "chain" do the inspecting. Advantage is frequently taken of the opportunity to pay all operators in the chain only for good work turned out at the end of the chain, the theory being that this compels each man to goad on the other fellow to increase his output as well as to turn out accurate work. When this is done it seems to me it becomes a "chain-gang" plan. It has the merit of preventing additional labor on defective work, but is so conducive to ill will that it is not used very extensively.

There are other plans of inspection, most of which are variations or combinations of the above. It has been my experience that in every case their efficiency can be measured by the degree with which they satisfy the five given conditions, namely: certainty in fixing responsibility, success in preserving good will, efficiency in delimiting the inspector's authority, surety in making the operator detect defects, and accuracy in providing records of appreciable rejections.

12. MEASURING AND COMMUNICATING AIDS: GRAPHIC PRODUCTION CONTROL[1]

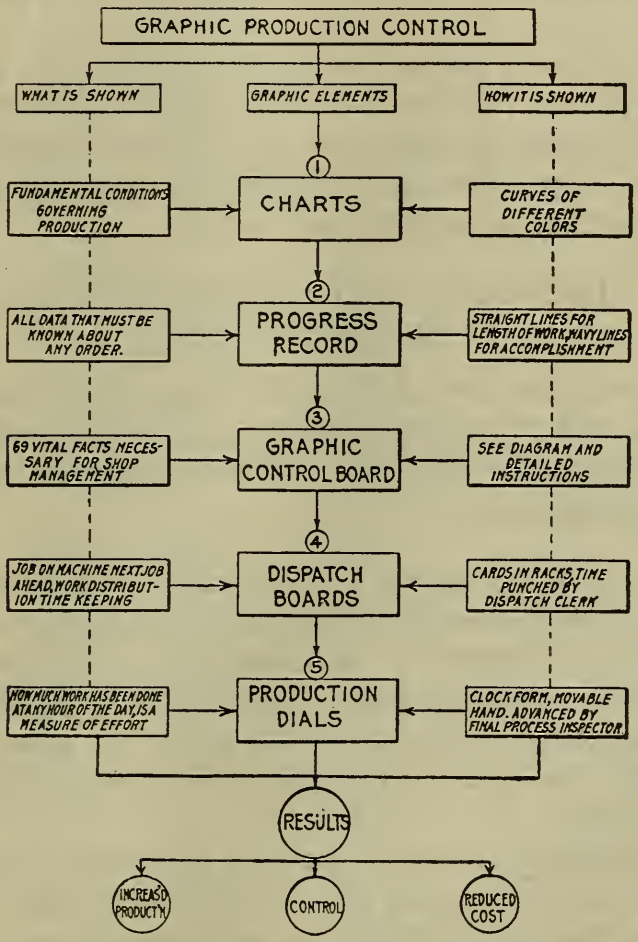
[As time has gone on, many schemes of using graphic methods of control have come into use. The diagram shown on page 585 gives a hint of the possibilities in this field.]

The three factors influencing the processing of materials are: Plant arrangement, shop transportation, control of production. If we analyze these three a moment, it will be found that the best plant arrangement with the most efficient shop transportation methods will not insure results if the methods of production control are at

[1] Adapted by permission from C. E. Knoeppel, "Graphic Production Control," *Industrial Management*, LVI (1918), 383–90.

fault. On the other hand, given the most efficient methods of production control, with only a fair degree of efficiency as to arrangement and transportation, and better results will be forthcoming than in the case just mentioned. In other words, provide proper production control first, *then tone up and make better the arrangement of plant and the shop transportation of materials.*

GENERAL SCHEME OF GRAPHIC CONTROL



With this fundamental in mind, the next step is to create a mechanism to take over the work of intelligently and efficiently controlling production. This should be done through the organization of a control department, a phrase which means more than "Production Department" or "Planning Department."

What will this control department control? Let us determine what the elements are. The activities of the workmen must be guided or there will be only ordinary results in production. The

movement of material as to purchase, receipt, issuance and transportation must be intelligently guided. The work to be done or the operations must be known and properly defined. The equipment (machines, tools, jigs and fixtures) must be in readiness for the work that is to be done. Hence we have four elements in control under which can be classified all factors influencing production, as follows: labor, which does the work; material, on which the work is done; operations, which is the work done; equipment, with which the work is done.

If one or more of the four elements are neglected in, or eliminated from, any plan of production control, graphic or otherwise, do not look for any substantial results, *for they will not be forthcoming.*

Control brings labor, material, work and equipment together and co-ordinates them for efficient manufacture.

13. MEASURING AND COMMUNICATING AIDS: A PROGRESS CHART[1]

[This is an illustration of the widely known Gantt Progress Chart for keeping track of the progress of work. The chart here reproduced deals with progress in deliveries. The same method is used to watch production progress.]

At the left of the chart is a list of articles to be procured. The amounts for which orders have been placed are shown in the column headed "Amount Ordered." The dates between which deliveries are to be made are shown by angles. The amount to be delivered each month is shown by a figure at the left side of the space assigned to that month. The figures at the right of each space indicate the total due at that date.

If the amount due in any month is all received, a light line is drawn clear across the space representing that month. If only half the amount due is received, this line only goes half way across. In general, the length of the light line indicates the amount delivered during that month.

The heavy line shows cumulatively the amount delivered up to the date of the last entry. It will be noted that, if this line is drawn to the scale of the periods through which it passes, the distance from the end of the line to the current date will represent the amount of time deliveries are behind or ahead of the schedule. It is thus seen

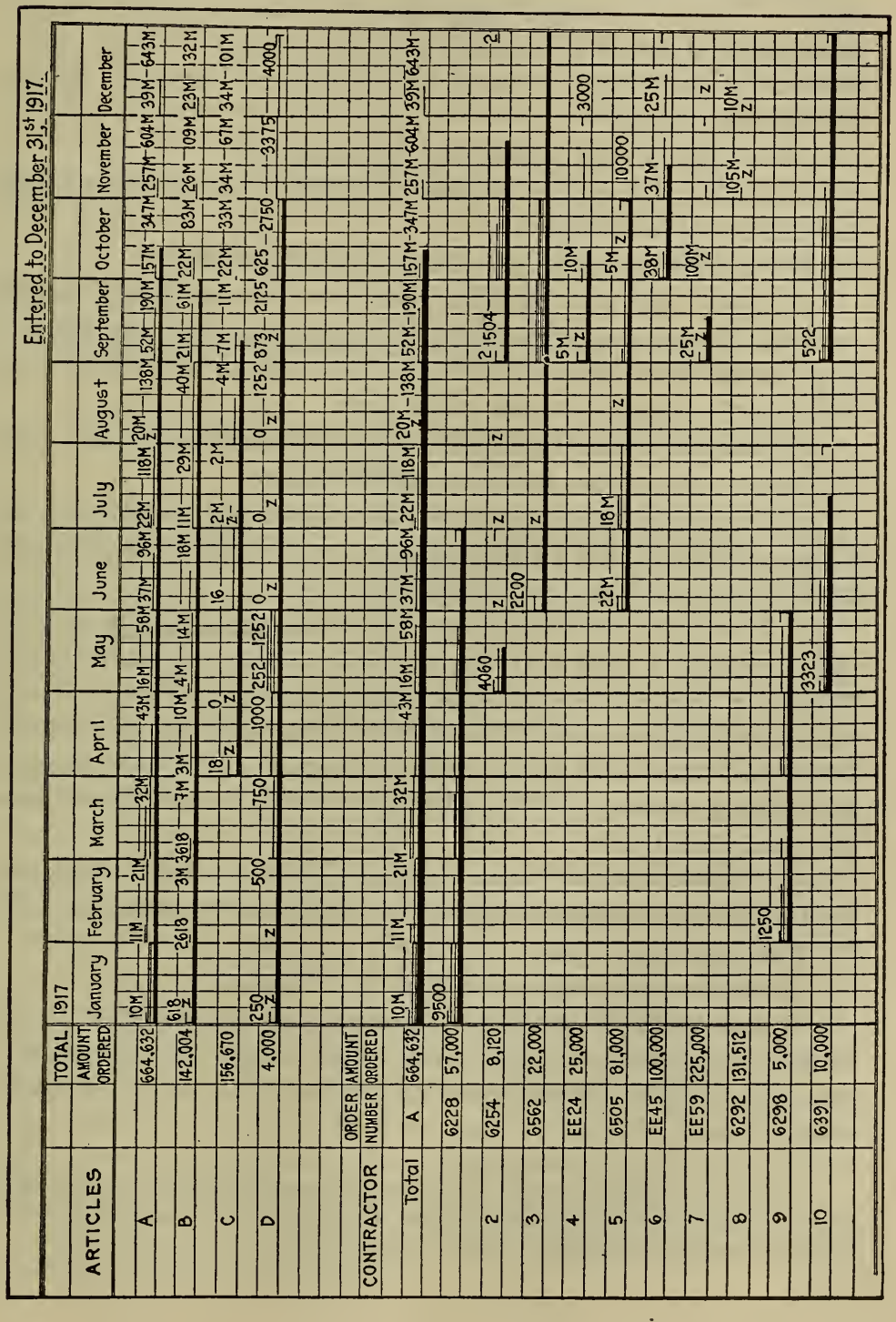
[1] Adapted by permission from H. L. Gantt, "Organizing for Work," *Industrial Management*, LVIII (1919), 91.

that the short lines are the ones which require attention as they are farthest behind schedule.

A, B, C, and D are summaries.

A is a summary of the orders shown on the lower part of the chart.

PROGRESS CHART FOR KEEPING CONTROL OF DELIVERIES



14. MEASURING AND COMMUNICATING AIDS: TIME STUDY[1]

Time study is the one element in scientific management beyond all others making possible the "transfer of skill from management to men." The nature of time study, however, is but imperfectly understood and it is therefore important to define it clearly. "Time study" consists of two broad divisions, first, analytical work, and second, constructive work.

The analytical work of time study is as follows:

a) Divide the work of a man performing any job into simple elementary movements.

b) Pick out all useless movements and discard them.

c) Study, one after another, just how each of several skilled workmen makes each elementary movement, and with the aid of a stop watch select the quickest and best method of making each elementary movement known in the trade.

d) Describe, record, and index each elementary movement, with its proper time, so that it can be quickly found.

e) Study and record the percentage which must be added to the actual working time of a good workman to cover unavoidable delays, interruptions, and minor accidents, etc.

f) Study and record the percentage which must be added to cover the newness of a good workman to a job, the first few times that he does it. (This percentage is quite large on jobs made up of a large number of different elements composing a long sequence infrequently repeated. This factor grows smaller, however, as the work consists of a smaller number of different elements in a sequence that is more frequently repeated.)

g) Study and record the percentage of time that must be allowed for rest, and the intervals at which the rest must be taken, in order to offset physical fatigue.

The constructive work of time study is as follows:

h) Add together into various groups such combinations of elementary movements as are frequently used in the same sequence in the trade, and record and index these groups so that they can be readily found.

[1] Taken by permission from F. W. Taylor, "Discussion of Report of Committee on the Present State of the Art of Industrial Management," in *Journal of American Society of Mechanical Engineers*, XXXV (1913), 494–95.

i) From these several records, it is comparatively easy to select the proper series of motions which should be used by a workman in making any particular article, and by summing the times of these movements, and adding proper percentage allowances, to find the proper time for doing almost any class of work.

j) The analysis of a piece of work into its elements almost always reveals the fact that many of the conditions surrounding and accompanying the work are defective; for instance, that improper tools are used, that the machines used in connection with it need perfecting, that the sanitary conditions are bad, etc. And knowledge so obtained leads frequently to constructive work of a high order, to the standardization of tools and conditions, to the invention of superior methods and machines.

See also p. 844 The Range of Time and Motion Study.

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15. MEASURING AND COMMUNICATING AIDS: MOTION STUDY[1]

[This is an account by F. W. Taylor of the work of Mr. Gilbreth in making a motion study of bricklaying. Such a motion study should, of course, be followed by time study and task-setting, in the Taylor philosophy.]

He [Mr. Taylor] would briefly go through the study which Mr. Gilbreth made. He found himself standing on a scaffold with a pile of bricks on the floor and the mortar board alongside him, a brick wall being built on the left. The first motion made by a bricklayer was to take a step to the right. Was that step necessary? He would show later on that the step was not necessary. Next, after taking the step to the right, the bricklayer stooped down to the floor, disengaged a brick from the pile of bricks, and raised his body up again, either to full height or to partial height. Was it necessary for the bricklayer to lower a 240-pound weight to the floor in order to raise an 8-pound brick $2\frac{1}{2}$ feet? Mr. Gilbreth, after a great deal of work, devised a scaffold on which the bricks were placed at the same level with the wall, and kept at the same level at all times with the wall. It was a scaffold on which the man stood in one place, while a little table was placed alongside him on which the bricks and mortar

[1] Taken by permission from *Transactions of the American Society of Mechanical Engineers*, XXXII (1910), 787–88.

rested. That was a very simple invention, but why was it not done 4,000 years ago, or why had it not been done in the meantime? Because no one had made a scientific motion study of the bricklayer. The bricks were placed on this supplementary platform at just the right height, so that the bricklayer merely turned round, picked up a brick with a rotary motion of the body and put it on the wall. Mr. Gilbreth then found that every bricklayer, as he raised the brick, threw it over in his hand at least one, sometimes two, sometimes three times. That was done for the purpose of examining whether the brick was sound and not chipped; he would not put a brick with a chip out of it on the outside of the wall where it showed. He therefore threw up the brick from habit, apparently just for the fun of it; he threw it up a second time to look at the edges, and sometimes a third time before he laid it on the wall. Mr. Gilbreth said, Was that necessary? and after a great deal of thought he devised the following plan for doing away with all of these motions. As the bricks were unloaded from the car or from the team, a laborer was stationed at a suitable bench, where the bricks were examined by him, and placed right side up, with the proper edge and the proper end on a wooden frame about 3 feet long; this frame held about 90 pounds of bricks, and was so constructed that the bricklayer's hand went right into it and seized the brick without having to disengage it from the tangle on the floor. He took the brick out in the exact position in which it was to be laid in the wall, without any throwing and without any change of position.

Mr. Gilbreth next found that the bricklayer worked with one hand only at a time. Why? Because the brick pile being on the floor and the mortar board some distance from it, they were too far apart for the man to take a dip of the mortar and pick up a brick at the same time; it took two motions. By building the scaffold in the way he had described, and by placing the bricks and the mortar close together, using a deep mortar box instead of a mortar board, brick pile and mortar box were brought within the range of the bricklayer's two eyes at the same time, so that he picked up a brick with the left hand, took a dip of mortar with the right hand with a single movement as far as time was concerned, then turned around, spread the mortar, and laid the brick in the wall. The step which was first taken by the bricklayer had been abolished, by reason of the fact that Mr. Gilbreth had studied in great detail the exact position which the feet of the workman should occupy with relation to the wall on the left

and the brick and mortar on the right, in order to reach his brick pile and mortar with the greatest ease in the several different kinds of bricklaying. The workman, if he had his feet in the proper position, could move from one to the other without a step. The scaffold had been made adjustable, so that a cheap workman was able to walk all day long round the building and adjust the scaffold with the workmen on it to its new height, keeping the wall and the bricks and the workman at all times at the proper height as they went along. The workman did not have to stop while the scaffold was adjusted. Mr. Gilbreth also found that all bricklayers, after they set the brick, tapped it down in order to get the joint the right thickness. From his experience in his youth Mr. Gilbreth knew that if the mortar was properly tempered it was possible to take the brick and press it with the hand to the right height. The mortar was therefore carefully tempered, so that the bricklayer could readily press the brick to the right height and thus save the time taken in tapping.

He desired to summarize what had been done, because it was typical of what could be accomplished in every trade, without exception. He did not say that as much as this could be accomplished in all cases, and yet it was typical of what could be done through motion and time study in every trade, provided sufficient attention was given to the subject. He believed it was three years before Mr. Gilbreth finally completed his motion study and obtained the full benefit from it, so that the motions of the bricklayer were reduced from eighteen to five, and in one case from eighteen to two.

16. MEASURING AND COMMUNICATING AIDS: CLASSIFICATION AND SYMBOLS[1]

Classification is nothing more nor less than segregating those things with which we deal into like and unlike according to various bases—kind, purpose, use, effect, or what not. Necessarily dealing first with units, as investigation proceeds we are inevitably led, if progress is to be made, to a sifting and sorting and finally to a more or less logical grouping of these units upon a basis which will best serve our purpose.

A classification should conform with the following requirements:

First: It must be logical and utilitarian—founded on a basis proper to its effective use. If the object be to classify the various

[1] Adapted by permission from H. H. Farquhar, "Factory 'Nicknames' That Save Time," *Factory*, XXIII (1919), 50–53.

kinds of wood for the practical use of a paper manufacturer, for instance, who is primarily interested in length of fiber, one would not logically group first (or probably at all) by tensile strength or color, for there is no apparent relation between these characteristics and fiber length: if the classification is to be of most practical use to the architect, however, tensile strength and color would form primary subdivisions of the classification while the length of fiber would be of little or no concern.

Second: It must proceed consistently from the general to the specific. In classifying different kinds of expense in the factory, for instance, it would be inconsistent to start first with, say, "wages," follow this next with those in the "machine shop," and then as the third groups have "direct" and "indirect" wages. A more logical, as well as practical, grouping would be first "machine shop" then "wages," the latter then being subdivided into "direct" and "indirect."

Third: It must be capable of being indefinitely and consistently expanded. Plenty of "gaps" must be left for subsequent use.

Fourth: It must be consistent in adherence to the particular basis and method used; in other words, it must possess continuity.

Fifth: It must be inclusive up to the present state of knowledge.

Proper classification and symbolization are as indispensable to real progress and scientific control in the industrial establishment as in the chemical laboratory. That this need is quite generally felt is evidenced by the rarity of a case where a plant is found which has not made some attempt along these lines.

A symbol is simply a sign, letter, emblem, or character of some kind which is used to represent another, usually a longer, expression. After a given classification is determined upon, the next step is to assign to each component of the classification a symbol which will approximately represent it. The act of symbolizing then naturally succeeds and must logically conform to the classification.

Since there is, however, almost no limit to the field from which symbols are chosen, it follows that the list of requirements to which a system of symbols must conform is unfortunately short. It is hoped, however, that there will be not a few who will agree with the writer that the following requirements should nearly all be raised to the "must" class:

First: It must be definite and clear. One symbol must mean but one thing, and any one thing must have but one symbol.

Second: It must be flexible for possible expansion of the classification.

Third: It preferably should be capable of being easily learned.

Fourth: It preferably should be capable of being easily remembered—mnemonic and suggestive. Thanks to Berzelius we are not likely ever to forget that C stands for carbon, N for nitrogen P for phosphorus, and so on; how many of us, however, can picture or reproduce from memory the hieroglyph which the almanac tells us stands for Aries, Taurus, or Gemini; Mercury, Venus, or Earth?

Fifth: It preferably should be as brief as is consistent with definiteness. And since the object of brevity is the saving of time, this requirement emphasizes the fourth one above (easily remembered) in that time may not be unnecessarily lost in repeated reference to the key.

Sixth: It preferably should be as simple as is consistent with definiteness and clearness. It is not only more mnemonic but also infinitely simpler to write C instead of the hieroglyph for carbon. It is, moreover, perfectly definite and perfectly clear. It may, on the other hand, be simple to write H65 for tenpenny wire nails, but it is neither definite, clear, nor mnemonic.

Seventh: It preferably should be elastic. The rules for its formulation should not be so rigid as to make necessary the violation of any of the above requirements.

Eighth: It preferably should be easily and consistently expanded. The degree of subdivision in the symbol should correspond exactly with the degree of subdivision of the corresponding group or item of classification; for this purpose I consider letters are better than figures, as there are 26 letters but only 9 numerals available for use in any one position.

Ninth: It preferably should be as foolproof as it is possible to make it. It should be difficult to make and easy to catch mistakes in the writing and interpretation of symbols. Thus if we use both capital letters and numerals in our symbol system, we must omit the letters I, O, Q, and preferably U, because when written hurriedly by hand they are extremely likely to be mistaken for numerals 1, zero, 2, and the letter V, respectively.

Tenth: It preferably should enable (or at least materially facilitate) a broad view and grasp of the whole subject dealt with. In other words, it must be simple, easily grasped and retained, and on a utilitarian basis. This reflects back to and emphasizes several of the above points.

Many different systems of symbolization are in use today, some of which are fairly comprehensive while others are simply unconnected makeshifts. It is not necessary to describe all these in detail, but the most common fall under one of the following broad bases of symbolization:

1. Composed entirely of numbers
   - A. By the use of whole numbers
   - B. By the use of decimals
   - C. By the use of fractions
   - D. By the use of decimals and fractions
2. Composed entirely of letters
   - A. By the use of capital letters
   - B. By the use of small letters
   - C. By the use of capital and small letters
3. Composed of numbers and letters

DECIMAL AND MNEMONIC SYMBOLIZATION OF SAMPLE ACCOUNTS

Name of Account			Decimal Symbol				Mnemonic Symbol
Main Account	Departmental Subdivision	Class of Expense					
Selling			300				C
Direct Manufacturing			400				D
	Assembling Dept.			410			DA
	Foundry			420			DF
	Machine Shop			430			DM
		Miscellaneous labor and expense			431		DMA
		Building repairs			432		DMB
		Retainers (idleness)			433		DME
		Furniture repairs			434		DMF
		Machine or work place repairs			435		DMM
		Inspection expense			436		DMN
		Power transmission repairs			437		DMP
		Reclamation of errors			438		DMR
		All other expenses			439		*14 letters still available*
		Stores and supplies				439.1	DMS
		Trucking expense				439.2	DMT
		Wages and salaries				439.3	DMW
		Cleaning expense				439.4	DWZ
	Pattern shop			440			DP
	Forge			450			DR
Product			500				E to W
Stores			600				S
Machinery—Capital			700				Y
Land and Buildings—Capital			800				Z

See also p. 197. Job Analysis.
p. 221. Some Aspects of Rating Scales.
p. 333. Measuring Aids May Result in Expense Standards.

17. MEASURING AND COMMUNICATING AIDS: COST-ACCOUNTING

A. THE DISTRIBUTION OF EXPENSE[1]

The underlying idea of all methods of expense distribution or apportionment is to use some one or more of the visible, tangible, measurable elements as a gauge, and to prorate the expense allotment by it. That is, they burden each job or each unit of product in proportion to the material that goes into it, or the wages paid for it, or the time spent working on it, or the use it makes of the machines and other facilities in the factory. This gives us five cardinal methods of expense distribution: by material, by percentage on wages, by man hours, by machine rates, and by production factors. We will take up their operation and their characteristics successively.

Distribution of expense by material is a method of limited applicability. Its usefulness is confined to comparatively simple industries such as metallurgical or structural material works, where the product is nearly or quite uniform. In a brick yard, or a blast furnace plant, or a gas works, or perhaps in a pipe foundry or other establishments of like character, it may work as well as any other plan, simply because there is no need of distribution, properly speaking, but only of equal subdivision. Indeed, if the product of a plant is absolutely homogeneous—all just alike—it makes no difference whether you apportion expense by count, or weight, or measure, or flat cost—you cannot get wrong as between one unit and another.

The percentage-on-wages method of apportioning factory expense is probably the most generally used. As a starting-point in this method, we take the total for a given time (say a month or a year) first of the wages of the productive labor during that period, and second of the factory expense during the same period, and we find what is the percentage relation of the expense to these wages paid to productive labor. Suppose we find that the total factory expense is 60 per cent of the direct labor pay-roll; then we load every job done during the period with 60 cents additional for each dollar of direct wages that is expended upon it. If we find, for instance, that a certain small steam pump is shown by the job ticket to have cost $50 for material and $100 for labor, we add 60 per cent of $100, or another $60, for the factory burden, and obtain as the shop cost of the product $50 *plus* $100 *plus* $60 *equals* $210.

[1] Adapted by permission from C. B. Going, *Principles of Industrial Engineering*, pp. 97–102. (McGraw-Hill Book Company, 1911.)

If our output is all substantially of the one general class, and if the various machines, tools, or pieces of apparatus in our manufacturing plant are not very different one from another as to expense of operation, and if our wages are fairly uniform as between one operative and another, the results obtained by this method will be quite accurate. But if we have a great difference in equipment, having some very small machines taking little room and power, and cheaply operated, and some very large machines taking up a great deal of room and power, and involving large expense for operation and wages; if we have passing through the shop some very heavy work and some very small and light work; if some of our labor is highly paid and some is very cheap—this method may lead to very inaccurate results.

The third method is the man-hour plan. It varies from the preceding system in that the distribution is made proportionate to the *time worked* on each job instead of to the *money paid* for that time. At the first glance this might seem like the same thing, but on further consideration it will become evident that there are important differences. For example, suppose we take a job away from a $3-a-day man, and give it experimentally to a good clever $1.50-a-day helper who completes it in the same number of hours that his predecessor did. Under the man-hour plan it will still carry the same expense burden as it did before, because it takes the same time. This is a correct result, for the mere change of operative has not changed in any way the demand which the work makes upon the general organization and facilities of the plant; has not changed in any way the amount of expense it creates, and hence should not change the expense apportioned to it.

In some particulars, therefore, the man-hour plan is more correct than the percentage-on-wages plan, but when we look a little farther we find that, like the percentage-on-wages plan, it takes no cognizance of the machine element. *All* jobs taking two hours are burdened the same, whether the two hours' time is on a valve-seat grinder or on the largest engine-bed planer in the shop.

The machine-hour method of expense distribution makes a much closer approach to accuracy than either of those so far described, because it recognizes the fact that in modern manufacturing the producing unit is not a single individual, but a complex combination of the machine or piece of apparatus, the man or men tending this machine, the equipment surrounding the machine, and the suitably

prepared space necessary for the installation and operation of the machine. In further explanation of this method of expense distribution the term "machine" is used in a general sense, with the understanding that it includes anything from a soap kettle to a jeweler's lathe.

In the administration of the machine-hour method of apportioning factory expense, the preliminary step is to determine on an hourly basis the cost of running each machine in the works. This cost includes the charge for rental, lighting, and heating of the space the machine occupies, and the surrounding space necessary for its operation; interest on the cost of the machine and allowance for repairs and depreciation; cost of power to run the machine; cost of services, such as cranage and transportation of various kinds to feed or to remove materials; cost of indirect labor attendant upon the machine; any incidental or special expenses; and a just proportion of the general burden of administration, superintendence, non-productive factory labor, etc.

Having obtained the totals of these various charges for a month or a year, they are divided by the number of hours during that time the machine can be expected to run, this figure being reached by a careful study of past experience and if necessary corrected by later actual observation. The quotient is the hourly rate of that machine. Every job coming to the machine is then assessed with this charge for the number of hours or fraction of an hour it spends on the machine.

Evidently, if each machine in the plant is thus rated, and each job coming to each machine is thus assessed with its individual expense burden, and if all the machines are in operation during the normal and expected portion of the time, the whole expense burden would be distributed in close accordance with the use each job has made of the facilities of the shop. This seems as fair a basis as could be found. The trouble begins when the activity of the plant differs largely from normal. The machine rates then distribute too much or not enough to cover the actual expense, according as the plant is running overfull or is partly idle.

B. THE SERVICES OF COST-ACCOUNTING[1]

Through the aid of accurate information concerning costs the proprietor or administrative officer is enabled to keep in close touch

[1] Adapted by permission from J. R. Wildman, *Principles of Cost Accounting*, pp. 2–4. (The William J. Hewitt Press, 1911.)

with conditions, shape the operating policy of the future, and guide the operations as they mature.

He is enabled:

a) To determine which lines of production or merchandise are profitable and which are unprofitable; to institute methods for extending and increasing the sale of such lines as are profitable and to retard the sale of, or withdraw entirely from the manufacture, or sale of, such lines as are unprofitable; to decide intelligently the lines on which commissions may be allowed to salesmen and the extent of such commissions.

b) To reduce costs; either through a reduction of the elements composing costs, or through an increase in the production.

c) To allocate "leaks" and stop unnecessary waste or extravagance.

d) To develop the highest type of productive efficiency. To bolster up the weak points and harmonize the work of the different departments, or operating groups.

e) To gauge the efficiency of managers, relatively speaking, by comparing one manager with another. The manager, whose cost of producing soil pipe per ton is $7.00, is obviously not as efficient or capable as the man who under precisely similar conditions can produce the same product at a cost of $5.00 per ton.

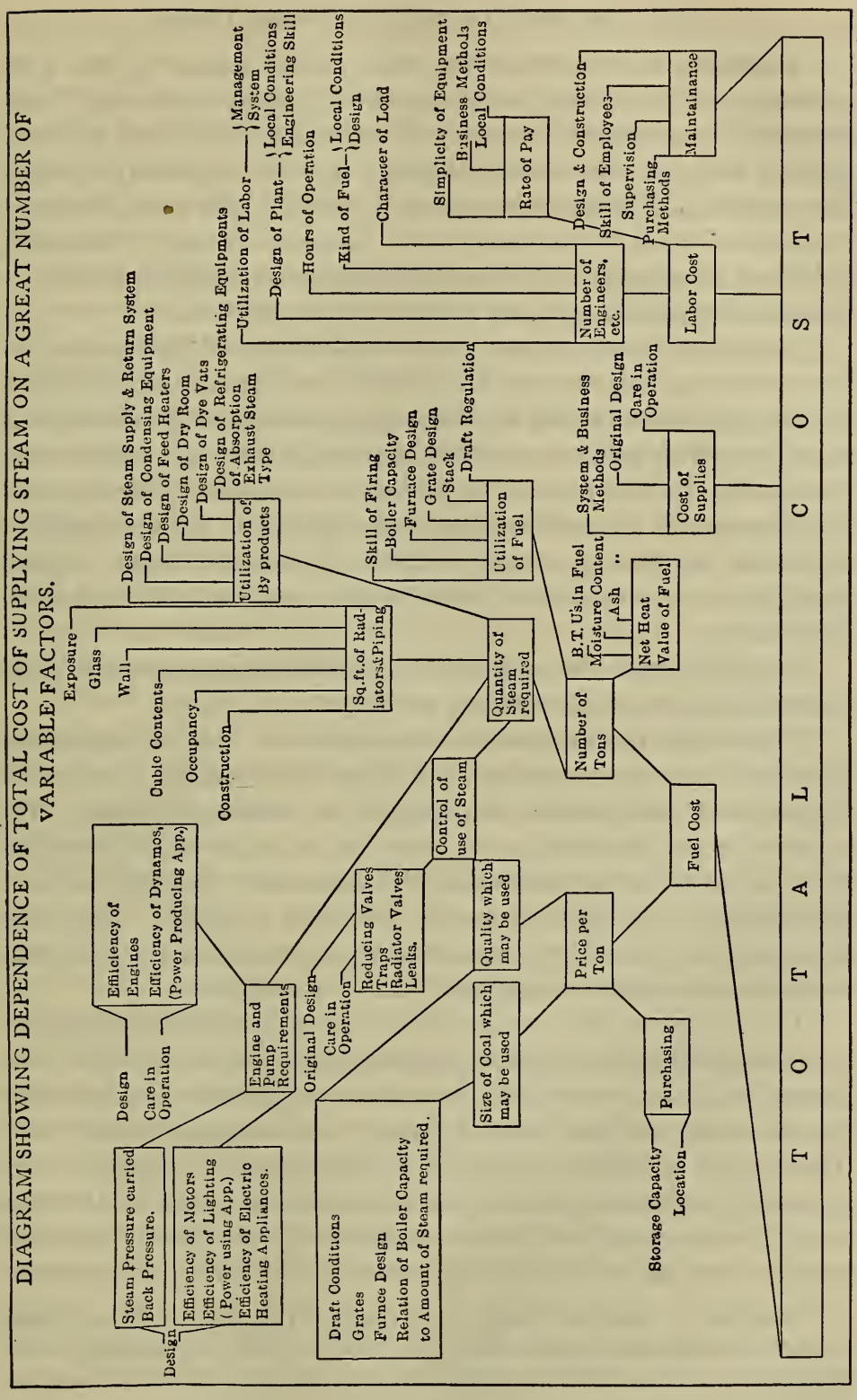
f) To compare the work of similar foremen, departments, machines, operatives, or other centers of production.

g) To compare costs in general of one period with another.

h) To compare actual costs with estimated or predetermined costs. The tendency today is toward standardization.

Modern business organization has become so complex as to have passed beyond the limits of individual observation, unless the individual has some artificial means of transcending these limits. The time has passed when the administrative officer can be in touch with all the details of the business. Cost statistics offer such a man a means of transcending his individual limits. They afford him an opportunity of having placed before him at stated intervals a picture, as it were, of his business operations. The administrative officer, or proprietor, draws his conclusions from the picture, and is afforded thereby a basis on which to found his judgment as to future operations and policies.

VARIABLES IN COST ADMINISTRATION



C. THE BASIS OF MANUFACTURING COSTS[1]

Inasmuch as the cost of an article is the means by which the economy of its production is measured, proper costs may assist materially in producing economy of production if the cost system is devised with the idea in mind that this is to be its primary function. In order that it may perform such a function, the results must be available at once to the executive in immediate charge. Moreover, all items of expense that do not contribute to production must be eliminated from the cost and presented in another form.

To operate a cost system, we must realize that all the expenses of a manufacturing business may be divided into three classes, as follows: (1) the expense of buying and storing the raw material (this expense must be added to the cost of the material before it is delivered to the factory, and not put on the product as a manufacturing expense); (2) the expense of marketing the finished product; (3) the expense of operating the factory, which is further divided as follows: expense which does not contribute to production; expense which does so contribute.

The last item is the only one with which we are concerned in the determination of manufacturing costs.

While there is undoubtedly one most correct way of determining these costs, we must recognize that all such methods are more or less approximate, and therefore no one can be considered perfect. The attempt to get absolutely exact costs has led to no end of complications, often with the result that the reason for obtaining the cost was entirely lost sight of in the desire for accuracy. The most important fact, therefore, is that we shall not include in manufacturing costs the items that do not contribute to production.

Let us suppose that a manufacturer owns three identical plants of an economical operating size, manufacturing the same article—one located in Albany, one in Buffalo, and one in Chicago—and that they are all running at their normal capacity and managed equally well. The amount of indirect expense per unit of product would be substantially the same in each of these factories, as would be the total cost. Now suppose that business suddenly falls off to one-third of its previous amount and that the manufacturer shuts down the plants in

[1] Adapted by permission from H. L. Gantt, "The Basis of Manufacturing Costs," *Industrial Management*, LIII (1917), 369–70. and "The Relation between Production and Costs," *The Journal of the American Society of Mechanical Engineers*, XXXVII (1915), 467.

Albany and Buffalo and continues to run the one in Chicago exactly as it has been run before. The product from the Chicago plant would have the same cost that it previously had, but the expense of carrying two idle factories might be so great as to take all the profits out of the business; in other words, the profit made from the Chicago plant might be offset entirely by the loss made by the Albany and Buffalo plants.

If these plants, instead of being in different cities, were located in the same city, a similar condition might also exist in which the expense of the two idle plants would be such a drain on the business that they would offset the profit made in the going plant.

Instead of considering these three factories to be in different parts of one city, they might be considered as being within the same yard, which would not change the conditions. Finally, we might consider that the walls between these factories were taken down and that the three factories were turned into one plant, the output of which had been reduced to one-third of its normal volume. Arguing as before it would be proper to charge to this product only one-third of the indirect expense charged when the factory was running full.

If the foregoing argument is correct, we may state the following general principle: *The indirect expense chargeable to the output of a factory bears the same ratio to the indirect expense necessary to run the factory at normal capacity, as the output in question bears to the normal output of the factory.*

This theory of expense distribution, which was forced upon us by the abrupt change in conditions brought on by the war, explains many things which were inexplicable under the older theory, and gives the manufacturer uniform costs as long as the methods of manufacture do not change.

Under this method of distributing expense there will be a certain amount of undistributed expense remaining whenever the factory runs below its normal capacity. A careful consideration of this item will show that it is not chargeable to the product made, but is a business expense incurred on account of our maintaining a certain portion of the factory idle, and chargeable to profit and loss. Many manufacturers have made money in a small plant, then built a large plant and lost money for years afterward, without quite understanding how it happened. This method of figuring gives a clear explanation of that fact and warns us to do *everything possible to increase the efficiency of the plant we have, rather than to increase its size.*

This theory explains clearly why some of our large combinations of manufacturing plants have not been as successful as was anticipated, and why the small but newer plant is able to compete successfully and make money, while the combinations are only just holding their own.

The idea so prevalent a few years ago that in the industrial world money is the most powerful factor, and that if we only had enough money nothing else would matter very much, is beginning to lose its force, for it is becoming clear that *the size of a business is not so important as the policy by which it is directed.* If we base our policy on the idea that the cost of an article can only legitimately include the expense necessarily incurred either directly or indirectly in producing it, we shall find that our costs are much lower than we thought, and that we can do many things which under the old method of figuring appeared suicidal.

The view of costs so largely held, namely, that *the product of a factory, however small, must bear the total expense, however large,* is responsible for much of the confusion about costs and hence leads to unsound business policies. Of course a method of accounting does not diminish the expense, but it may show us where the expense properly belongs and give us a more correct understanding of our business.

18. THE CONTROL OF LARGE *vs.* SMALL-SCALE INDUSTRIES

A. A PROTEST AGAINST TOO GREAT CENTRALIZATION[1]

Many of you have undoubtedly had more or less opportunity to observe the deplorable inefficiency of most of our large industrial concerns, especially those commonly known as trusts, where a number of formerly independent plants have been united under one common management. The plants are usually scattered over a considerable area and the central offices located in some commercial center.

The first step in the organization of these corporations has usually been the removal of the resident owners and managers from the various localities to the central offices and the subsequent attempt to carry on the functions of management by the superintendent and heads of departments. These men, in most instances, not having had any real knowledge of manufacturing costs and profits, are, of

[1] Adapted by permission from R. B. Wolf, "Individuality in Industry," *Bulletin of the Society to Promote the Science of Management*, Vol. I (1915), pp. 2–3.

course, incapable of conducting the business intelligently. It therefore becomes necessary for the central office to perform much of this work for the various plants.

A central purchasing department has undoubtedly many advantages, but as ordinarily conducted in large corporations these advantages are almost entirely offset by the obstacles placed in the way of free choice on the part of the mill organizations and the consequent discouragement of individuality in making selections. The impossibility of handling all of the purchases by one capable man necessitates delegating a lot of minor purchases to subordinates, who have no real knowledge of actual mill requirements. Even though they know what is required in one mill, they cannot know in others where conditions are not the same.

The purchasing agent should have full power to build up an efficient organization for keeping informed of the market conditions, so that requisitions from the mills can be handled with promptness and dispatch. The department should be able to furnish full complete information to the individual plants whenever they need it in order to properly purchase supplies. It should encourage the mills to furnish specifications and welcome attempts on their part to keep comparative records for the purpose of determining the best materials to use. It should always conduct itself toward each separate organization as if it were an outside firm, employed to give advice and assistance in every way possible to enable purchases to be made economically. Each plant should receive frequent reports from the purchasing department, giving complete information about materials found to be giving good results in other places. This one feature alone would make it immensely valuable to the parent-corporation.

Let us take accounting next. Why are accounts kept and what is their purpose? In the last analysis, accounts are records of the progress of accomplishment and are used to enable those in charge of the corporation's affairs to decide upon the future policy to pursue.

Why, then, should any attempt be made by the central office to keep accounts that are of strictly local interest to the individual plants? And why even attempt to dictate how and when these accounts should be kept? In so far as comparisons between individual plants are concerned this is justified, but no further, and even in this case it should not be pushed to a point where comparisons which local conditions at the plants demand are not allowed.

The foregoing should not be misconstrued to mean that I believe a central accounting system for corporations is not necessary or desirable, for it most certainly is. The accounting department should confine itself, however, to such accounting as is of inter-plant nature and not attempt to dip into local conditions, except in an advisory capacity.

The selling, in most cases, can be handled by the central office much better than any other function; indeed, the main purpose in forming large corporations was primarily to stop ruinous competition between plants, especially in periods of slight demand. There should, however, be much closer touch between the selling department and the mills and a much more intimate knowledge of operating conditions by the salesmen. The degree of this intimacy is, of course, one of the important things to be decided by the chief executive.

"Maintenance and construction" is another thing which should be touched upon. There is usually much damage done to the individual plants by decisions of "absentee" engineers, whose knowledge of the plant conditions cannot be of such an intimate nature that they can make intelligent decisions. This very often actually retards progress in the organization and serves to discourage individual effort upon the part of the local mill management.

A high-grade consulting engineer employed to devote his entire time to the corporation's affairs would be a very valuable asset. He should conduct himself toward each individual plant exactly as he would if they were all independent establishments and his own clients. There would be this very important difference, however, which would mean much greater freedom of action, i.e., he would be entirely free to give each plant the benefit of his experience in others, and in this way would be a constant, highly intelligent means of exchanging ideas of mutual interest and benefit.

I make a plea for the development of plant individuality. This is not merely a return to old conditions existing prior to amalgamation but a regaining of all the advantages of the old order of things with the additional advantages of the new.

B. THE SMALL-SHOP BASIS OF PRODUCTION[1]

Leadership "carries" better in the small industry. The proprietor's personality and enthusiasm can lay hold upon twenty-five

[1] Adapted by permission from G. H. Haynes, "The Small Industry in a Democracy," *The Journal of the American Society of Mechanical Engineers*, XL (1918), 535.

or fifty men, whereas to a force of five hundred he would be simply "the boss." *Esprit de corps* and morals are of natural growth in the small shop; they are hard to develop and maintain where there is no human contact between the employer and the workmen and where the workmen are not personally known to one another. In the small shop there can be brought home to the individual workman the direct interest which he has in maintaining both the quantity and the quality of the product; he can be brought to see clearly how his own work is discredited and his own wage lowered in consequence of the soldiering or waste of material by any member of the working force. It goes without saying that the mutual understanding between employer and employees in a small industry is a strong influence in lessening the frequency and the seriousness of labor controversies.

In fact, the advantages of the small shop are so obvious that in these days of giant corporations some of the most interesting and promising experiments in industrial management are in the attempts to reorganize production "on the small-shop basis," assigning to a superintendent and small force of men the making of a particular part or the completion of a certain series of processes in turning out the finished product.

See also p. 705. Relative Importance of the Main Forms of the Business Unit.
p. 600. The Basis of Manufacturing Costs.
p. 533. Technological Industry is Frequently Large-Scale-Industry.

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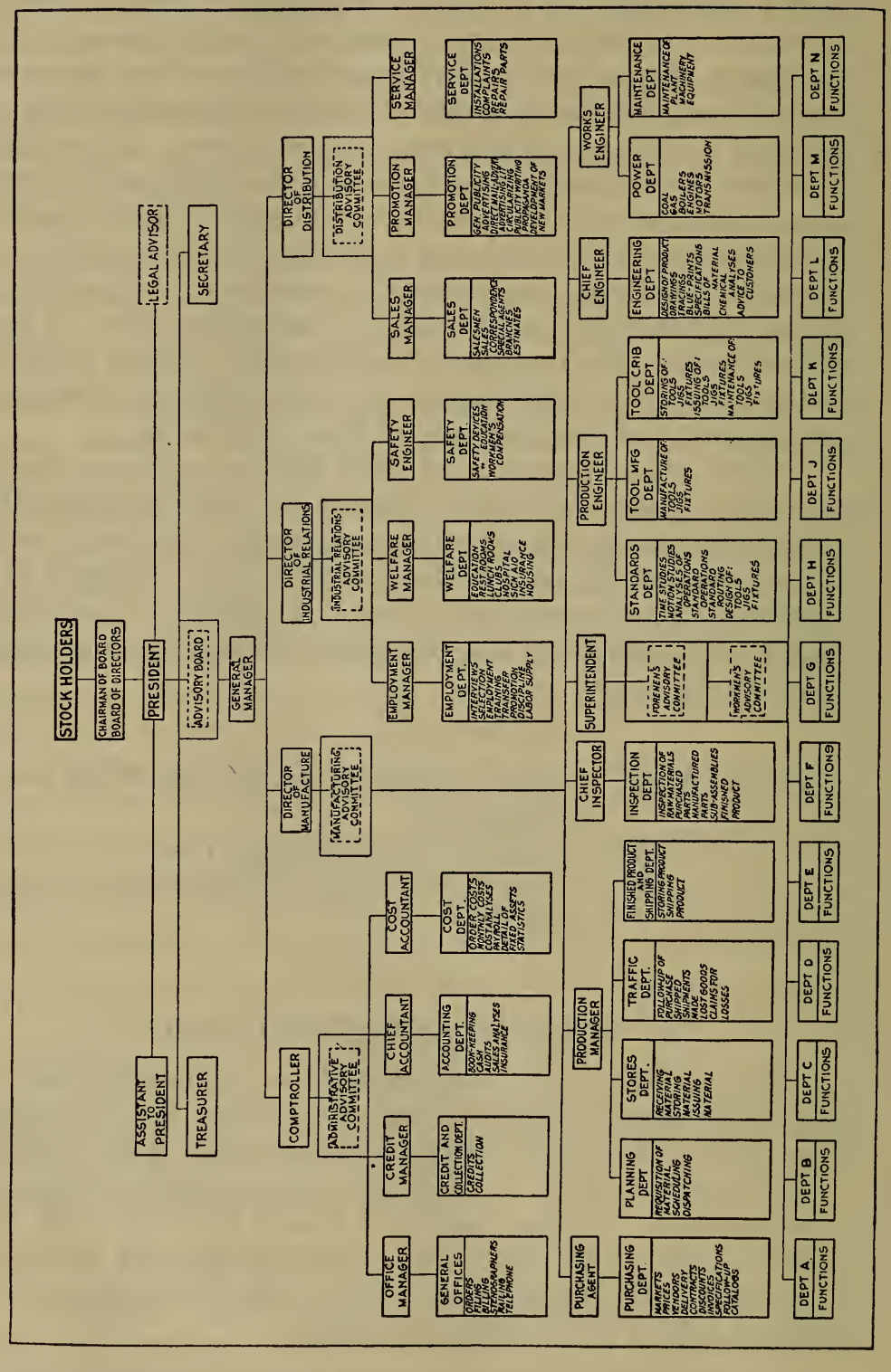
19. SOME ORGANIZATION CHARTS[1]

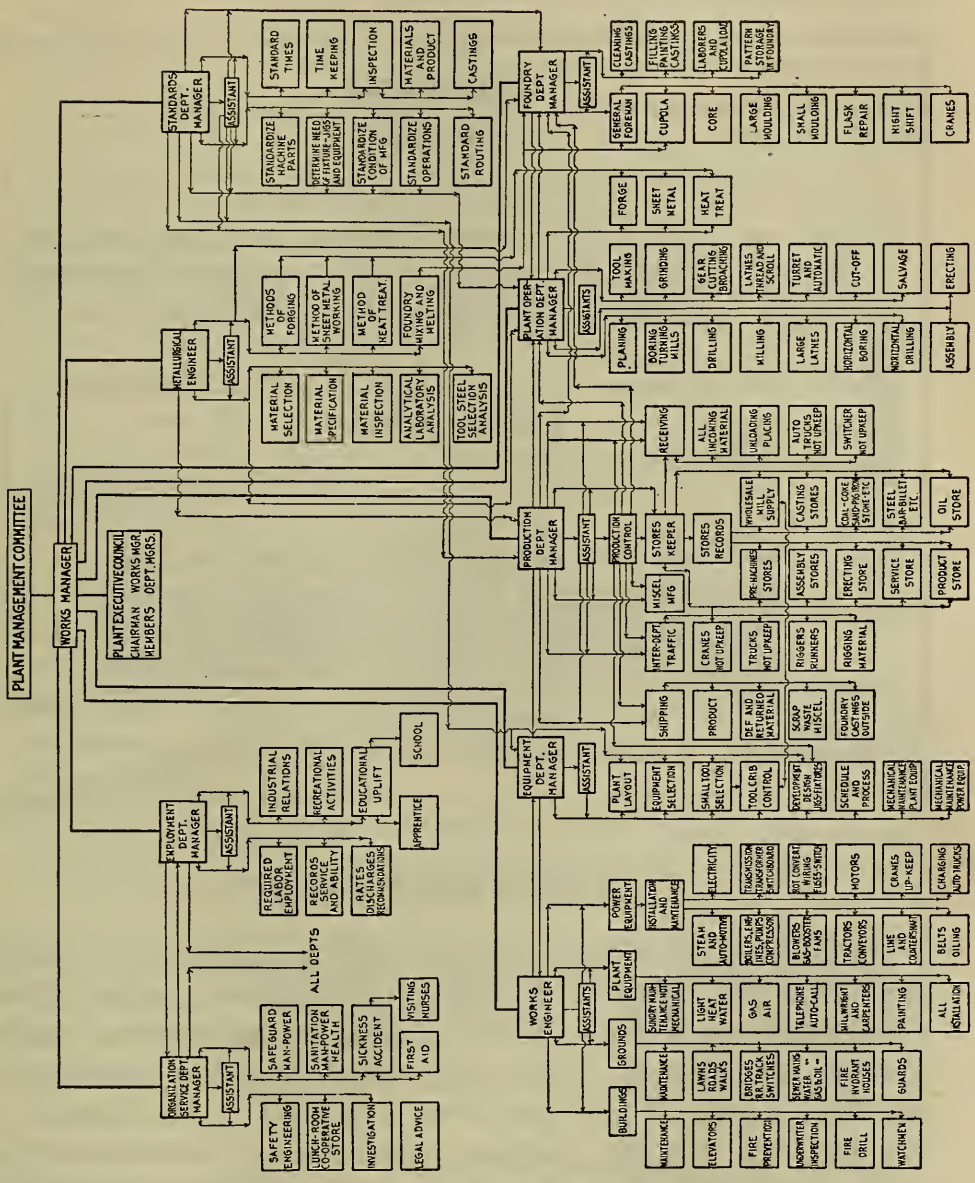
[It is well to be clear concerning what an organization chart is. It is not organization itself; it is not even a picture of that organization. At the most, it is a picture of *certain aspects* of an organization, usually of lines of authority and sometimes of lines of communication. It shows nothing of what is most vital of all, the spirit and vigor of the organization. The accompanying charts are accordingly useful primarily in hinting at the relationships of the different parts of the businesses concerned.]

Taken by permission from articles by S. H. Bullard, L. V. Estes, and Norman Howard in *Industrial Management*, LIX (1920), 58–9, 492, and LX (1920), 442.

SUGGESTED ORGANIZATION OF LARGE MANUFACTURING COMPANY SHOWING RELATIONSHIP OF ELEMENTS

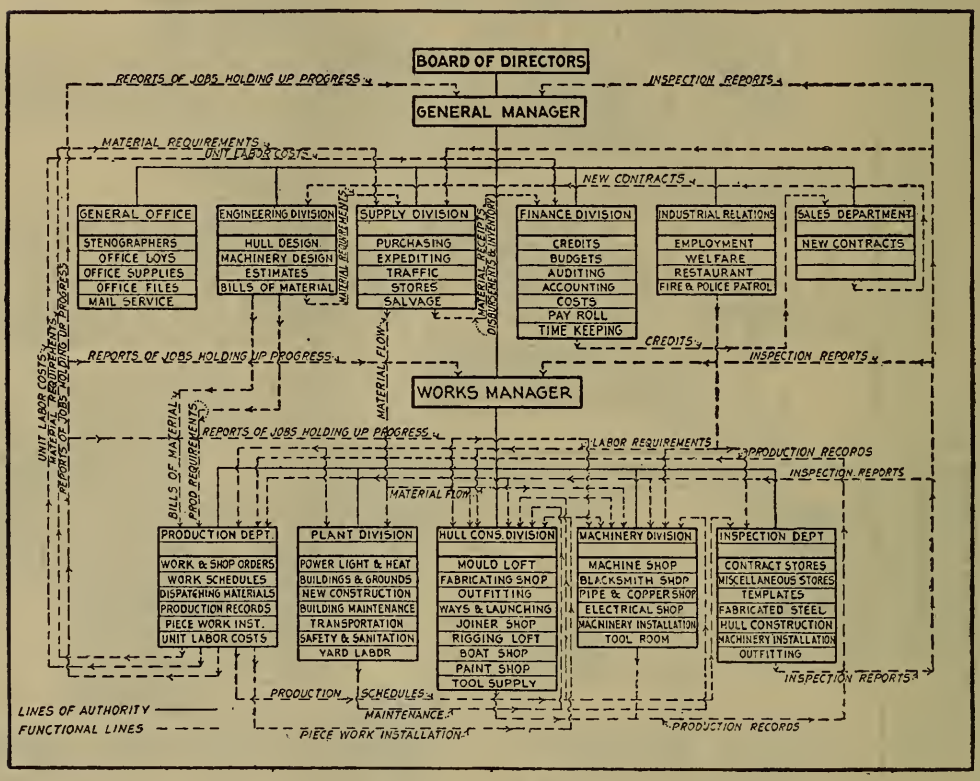


PLAN OF THE BULLARD ORGANIZATION SHOWING THE INTERRELATION OF DEPARTMENTS



"Work through selection No. 9 on Five Organic Functions in Manufacturing Industry (pages 570–78) and see where these functions are dealt with in the organization charts on pages 606 and 607."

ORGANIZATION PLAN OF A MODERATE-SIZED SHIPYARD SHOWING ADMINISTRATIVE AND OPERATIVE FUNCTIONS



C. Scientific Shop Management

In the foregoing sections we have seen the background of modern production and what is involved in production control. There remains a survey of that outlook on production control which is called scientific management. This term is used in both a broad and a restricted sense. It has been broadly applied to all attempts to establish, by scientific methods, standards of performance and policies and mechanisms of control. Thus interpreted there is little forward-looking management that may not be included in the term. In a more restricted sense it refers to the "Taylor System," as that has been developed by F. W. Taylor and a small, devoted group of followers. Since the Taylor System is the most highly developed of all so-called scientific management, it has seemed best (aside from the historical introduction presented in Selection 20) to arrange our selections so that they bear mainly upon that system.

PROBLEMS

1. Write out a paragraph showing that the scientific management movement (Taylor began his work in the 1880's) is related to the trust movement and to the revolution in marketing methods.
2. Review Section C (pp. 153–92) of the chapter on the administration of personnel, noticing particularly the questions on page 162. How do you account for the fact that the earlier writings of the "efficiency movement" were in the field of wage payment?
3. "Some of the wage systems are merely modes of payment. Others are philosophies of management." Explain.
4. Precisely what do you conceive Taylor's contribution to have been?
5. "Was there no planning in industry prior to the advent of the Taylor Planning room? Of course there was." What is the real significance of the use of the planning room?
6. What is meant by calling the Taylor plan "functional management"? Can you draw an organization chart of the Taylor plan? Is such a chart essential?
7. Does the separation of "planning" from "doing" mean that less skilful workers are likely to be in demand?
8. "The Taylor System seeks to restore individual responsibility in industry." Do you agree? What are the devices used?
9. "The Taylor scheme is just a further development of specialization. Still further responsibilities are taken away from the worker, and management is also further specialized to enable it to assume these responsibilities." Comment.
10. What are the advantages of functional foremanship? Has it disadvantages? Is it the essence of the Taylor plan? Do you understand that every business is to have eight foremen?
11. It has been charged that the standardization required under the Taylor plan hinders progress. What things require standardization under this plan? Is such standardization essential or merely desirable? Will it hinder progress?
12. Do you agree that the method of Taylor management is the method of a true science?
13. "It is of the essence of the Taylor plan that there should be precise prediction." What are the prerequisites of precise prediction?
14. Notice the organization chart illustrating unsystematized management (p. 622). What defects in control are indicated by this chart?
15. Many strong and wealthy business organizations grew up in the period of unsystematized management. Does this fact nullify the claims of the Taylor plan?
16. Compare Selections 9 and 23. Are they dealing with the same things? Are they contradictory?

17. Take the reading on "The Control of Manufacture under the Taylor System" (p. 624) and think out what items would have to appear on the balance of stores sheets; on the balance of work sheets. What are the risks of waste if these balance sheets are not kept?
18. "The one word which characterizes the Taylor plan is prevision." Do you agree?
19. "The Taylor plan is useful for only certain types of industry." Do you agree? Even if you do not agree, what types do you suppose the writer had in mind?
20. Notice that Hathaway lists "the general plan of organization" as the first problem to attack in installing the Taylor plan (see p. 633). Why?
21. Notice how far down in the list he puts time study. Why?
22. "The Taylor plan should always be a *development* rather than an installation in a plant." Why or why not?
23. "Scientific management substitutes the rule of natural law for arbitrary decisions of foremen and employers." How is this natural law obtained? Why are trade unionists so generally opposed to scientific management if it operates as the quotation indicates?
24. Give arguments for and against the position that scientific management democratizes industry. What does it matter, anyhow?
25. "Scientific management makes trade unions and trade union regulations unnecessary as a protection to the workers." Do you agree?

20. THE BEGINNINGS OF SCIENTIFIC MANAGEMENT[1]

[In various places in this volume we have caught glimpses of the forces which along about 1880 conspired to bring in a new order of economic phenomena (see especially pp. 153–59, 178, 256–62). This present selection, written in 1912 when the efficiency movement and scientific management were just beginning to attract widespread popular attention, will be found to be a useful addition to these glimpses.]

The history of the efficiency movement is like that of many another extension of knowledge, whether physical or mental. It is a record of independent partial contributions of discovery or interpretation, which later are found to be all interrelated parts of one great, harmonious and comprehensive whole.

[1] Adapted by permission from C. B. Going, "The Efficiency Movement," *Transactions of the Efficiency Society*, I (1912), 11–17.

Taking only the larger manifestations of this faith, we may identify distinctly at least seven which have come into being and have gathered force and volume within approximately the last century—some of them, indeed, within the last generation and a few within the last decade.

The first is the profession of engineering, which has grown up from the root idea of efficiency in the use of power and mechanical effort, and has carried this vitalizing principle into every branch into which it has expanded.

The second is the conservation movement, seeking to prevent hitherto reckless waste in the use of natural resources and the fundamental materials of industry.

The third is fire prevention, which looks toward better protection from a special form of waste of structures, equipment, and manufactured products.

Fourth, we find the propagandism of general hygiene and its extension into the wider sphere of eugenics, adapting the theory of conservation and the ideals of waste-prevention to the individual human unit and to the race at large.

Fifth comes welfare work and the effort toward reduction of industrial accidents—a manifestation differing distinctly in scope from general hygiene, and addressing its effort toward a particular class and a specialized purpose.

Sixth, in scientific management (using the term in a broadly descriptive sense, and not the narrow titular one in which it has sometimes been monopolized) we find generically the same concept, worked out into concrete policies and methods intended to raise the efficiency of processes and the prevention of waste in production, supervised or secured by human toil.

Seventh, less manifestly but no less truly, earnest prosecution of cost study and analysis, which leaped so strikingly into notice less than twenty years ago, is part of the same impulse—a potentially and then actively constructive application of effort toward efficiency in the realm of money.

To this group of seven distinctive manifestations of a single impelling idea in seven different fields should perhaps be added an eighth—the movement toward greater efficiency in government.

It is only in the field of application and in the elements or facts to which the effort is applied that these several movements differ. The essential concept or energizing ideal is always the same. It is

the elimination of waste. It is the raising of the ratio of useful result to effort expended. It is the bringing up of actual performance as near as possible to the level of a reasonable and equitable standard.

What might be called a self-conscious attempt at the improvement of industrial efficiency was specifically expressed in the literature and thought of the subject by occasional contributions dating back to the first half of the nineteenth century, although no well-informed wave appeared until about a quarter of a century ago. Perhaps it would be truer to say that there were two waves of thought, starting at different points of the horizon but converging and gradually coalescing.

The first of these impulses was originally analytical and was addressed to the careful, critical examination of costs, with a purpose of discovering the elements of expense and reducing them to basic units, so that one cost could be compared accurately, intelligently, and usefully with another. This is of course vitally necessary to the determination of standards, and on the fixation of standards depends the measurement of efficiency. The literature of cost study did not become prominent until about 1896, but from that date on it increased rapidly in volume and in intensity and definiteness of interest.

The second impulse was primarily constructive and addressed to individual situations with the purpose of reducing existing costs, whatever they might be, sometimes without very definite vision of either absolute, attainable standards, or of the relative importance of the factors attacked; but always with confidence that progress toward better things could be made, and *would* be made if any factor in the expense formula were diminished. For that was the underlying purpose in the earlier wage systems, and in the work of the sincere systematizers, who did much good, however many crimes may have been committed in the same name by later and less genuine disciples.

These agencies rapidly developed into the more complete, better balanced, and earnestly considered policies of comprehensive control, of which so-called "scientific management" is the most widely known example.

In a rapid review of this modern constructive movement for the betterment of industrial efficiency, the first efforts (first, at least, if we follow the order of public announcement) centered upon the workman, as the man most familiar with the conditions and possi-

bilities of every operation, and took the form of offering an inducement to him to increase his output by a better use of his knowledge, skill, and the facilities supplied. These measures were proposed in Mr. Henry R. Towne's "Gain Sharing," and reduced to more specific and practical methods in the Halsey premium plan, published in 1891, and in the Rowan, Ross, and other forms of premium payment which are substantially modifications of Halsey's idea.

While these measures were dictated by a sincere attempt to promote efficiency, they had faults of two opposite kinds. First, as the only element directly acted upon was the worker, many inefficiencies might still remain uncorrected in materials, machinery, processes, distribution, and sequence of work, or other matters. Second, in the temptation of increased earnings, with no accurate determination of a standard method or task, a worker might be stimulated to overexertion.

Five years later, in 1896, Frederick W. Taylor presented the differential piece-rate method, in which there is to be found a definite suggestion of organized methods designed to check both these tendencies, while still retaining the incentive of reward for high performance. It is scarcely more than a suggestion. The only specific institution proposed is a rate-fixing department, replacing by careful and thorough study the somewhat haphazard methods of setting standards by the judgment (or guess) of a foreman or minor official. The working conditions, upkeep of machinery and tools, dispatching and routing of jobs, etc., are broadly referred to as details in which the management should co-operate; but the prime force in the system is repeatedly stated to be the desire inspired in the worker to obtain the larger wages paid for accomplishment of the established task.

Five or six years later another important advance toward full recognition of the necessities for efficient working appeared in H. L. Gantt's paper on "Task and Bonus" (1901), supplemented by his second paper on "Graphical Daily Balance" (1903), both presented to the American Society of Mechanical Engineers. These formulated a complete scheme of management involving the use of scientific principles. In addition to the careful, thoroughly informed study of the operation and of the best way of performing it, there now appeared the added elements of printed scheduled instruction cards, and of deliberately appointed instructors, showing the workers how to perform the task. The method of payment, while it retained the bonus award to the successful task-worker, no longer penalized the

worker who tried but failed. He was still protected in the ruling day rate of his class.

Immediately thereafter, also in 1903, came Frederick W. Taylor's classical contribution on *Shop Management*, in which all the foregoing elements were embodied and incorporated with still more advanced ideas of scientific control of manufacturing operations. Much more attention was given to elementary time study as a basis for scientific time setting. Most striking of all, a new form of organization was proposed. All work was first separated into the two great functions of planning and execution. Each of these functions again was subdivided into four. Functional organization instead of fractional was proposed as the efficient means of performing all work in the most efficient manner.

About five years later yet came two contributions of unequal importance but both significant. The first was the suggestion, by Charles U. Carpenter, of the committee system, characteristic of a school of thought which I have elsewhere called the "school of suggestions" because it depends chiefly upon creating an attitude of mind in the managing officials. The second was Harrington Emerson's proposal of the "efficiency system," defined first in his book *Efficiency as a Basis of Operation and Wages*, and amplified in *The Twelve Principles of Efficiency*.

Mr. Emerson, like the specialists who preceded him, accepted most of the elements of scientific operation already recognized, as, for example, time study, task setting, standardized methods and standard instructions, dispatching and schedules of work. He recognized fully also the necessity of functional as well as fractional distribution of duty in any efficient organization. Instead, however, of the functional foremanship advocated by Taylor, Emerson adopted the model of line and staff furnished by the Prussian military organization, which was so triumphantly successful in 1870–71.

More important, however, than any institutional forms or measures advocated was Emerson's recognition of efficiency as a universal ideal —his identification of the agitation going on in industrial fields as part of something world-wide, indeed, universe-wide—as part of a great awakening to the sinfulness of waste, and of a struggle toward better utilization of the materials and forces supplied by an infinitely efficient nature.

Efficiency, therefore, is a concept immeasurably larger, vastly wider, and more general in its relations and applications, than scientific

management, which is often mistakenly used as if it were a synonymous term. Scientific management is one mode of promoting efficiency in one class of situations. The Taylor System is the most highly developed, most completely institutional, and therefore most closely specialized form of scientific management.

21. SCIENTIFIC MANAGEMENT IN PRODUCTION

A[1]

Mr. Taylor insists that the general principles, or philosophy, of scientific management should not be confused with the mechanism, which is merely incidental. He emphasizes four fundamental principles. First, the method of scientific management is the method of a true science. The organizing engineer "objectifies" a plant to be organized; he enters as an "outsider," bound by no traditions and prejudices of its management, holds it, so to speak, at arm's length, studies it by departments and as a whole, compares it with other similar plants of his experience, and observes defects that the "insider" does not see. In this process the truly scientific method of analysis into units and experimental recombination of them is followed, not superficially but exhaustively, until enough data are collected from which trustworthy laws may be derived.

A second general principle of scientific management is that there should be, and as a result of the laws derived by observation and experiment may be, a scientific selection of machines, material, and workmen.

The third principle of the new management is that a workman once discovered and assigned to the performance of the function to which he is adapted, the management should provide continuous instruction for him.

The fourth of Mr. Taylor's principles of scientific management is that there should be intimate co-operation between management and men and a redistribution of responsibilities. The workability of the new management, says Mr. Taylor, depends upon such sympathetic co-operation. There must be mutual recognition of the possibility of mutual helpfulness. This recognized, there must be a readjustment of duties, for under present systems of management

[1] Adapted by permission from H. S. Person, "Scientific Management," *Proceedings of Tuck School Conference* (1912), pp. 4–5, and "Scientific Management," *Bulletin of the Taylor Society*, II (1916), 17–19.

there is required of a workman so much as to make impossible his highest efficiency. The manager, under the present system, requires of the workman simply the accomplishment of a certain result. To the workman is left the determination of the methods as well as the actual performance. Under scientific management the experts in the planning room determine the method and leave to the workman freedom to apply all his energy to actual performance.

These four general principles constitute, according to Mr. Taylor, the philosophy of scientific management. The devices employed to give effect to these principles constitute the mechanism.

Aims, plans, policies and methods as they concern productive processes. As I analyze it, there are three principal aims in it: (1) seeking of more precise information through investigation, experiment, etc.; (2) as great an amount of prediction of what is going to happen in business operation as is possible on the basis of the unusual amount of exact information acquired; (3) precise control of the processes of conducting the business by various functionalized people in such wise as to bring about as precisely as possible the predictions which have been made on the basis of the exact information required.

1. Seeking of more precise information. It is in the scientific-management plant that investigation and experiment—the establishing of an experiment room with adequate equipment under the direction of capable investigators—have been worked out. It is in connection with this investigation and experimentation that time study has come in. I cite it as a method of acquiring precise information. Time study simply means a method of acquiring exact information with respect to the time which it takes a person to do a certain thing, with certain definite equipment, under certain definite conditions.

2. Precise prediction. If one by time study and other investigation has secured and filed information telling the time of performing a unit operation with certain tools and materials under certain conditions, then if an order comes in to do or make something which represents a combination of these unit operations, by a simple mathematical calculation it is possible to determine how long it will take to fill the order, what materials and tools must be provided, what conditions established, when work on each part should begin, when and how they should be assembled, etc. In other words, an accurate layout of work on the job becomes possible. In most plants layout is by guess. Guess involves waste. An accurate layout of separate

jobs means accurate layout and dovetailing of all jobs, and economical and efficient operation of materials, equipment and labor; in other words, more precise control.

3. Precise control. This means that to each of a number of persons shall be assigned, with authority, the responsibility of maintaining one or more of the standard conditions on the basis of which the prediction or layout of a job is made. The principal standard conditions to be maintained are: (See p. 555.)

a) Standard materials.

b) Standard storing and issuing of materials.

c) Standard conditions under which work is performed.

d) Standard methods of performing operations.

Through what machinery are the three primary aims of scientific management (investigation, prediction, precise control) accomplished? This machinery is described in the words *functional organization.*

Functional organization is carried out to an unusual degree in manufacturing plants by scientific management. First, there is functional organization in large; planning is separated entirely from doing. Now, in an ordinary manufacturing plant an order is received to make something. That is sent down to the foreman with an order to "make twenty-five of these by the 25th of June." The foreman turns to the workman and says, "start on these day after tomorrow." There your foreman has planned who is to do it; how long it will take; how it is to be done; and so on. Under scientific management, on the other hand, in a room called the planning room, where is kept on file all the information which has been gathered regarding all phases of operation, the planning is done. First, a list is made of the operations involved in filling this order, and of the materials and equipment required; second, an estimate is made of the time it takes to do each one of the operations with due allowance for uncertainties; third, a day is determined when work on the order is to start in order to meet the date of promised delivery. All planning of that sort is done, and proper orders are made out. On the proper date these orders are issued to the man who has charge of the material, telling him to send it to such and such a machine; and to the workman at that machine, telling him to start the work. Accompanying the order issued him is the analysis of the job and definite instructions for its performance.

I have been speaking about functional organization in the large—separation of performing, planning and investigating. There is also

functional organization in detail. [The following is *one illustration* of functional organization in detail.]

B[1]

Let us go over the duties which [an old-fashioned] foreman in charge, say, of lathes, or planes, is called upon to perform, and note the knowledge and qualities which they call for.

He must be a good machinist; must be able to read drawings readily; he must plan ahead and see that the right jigs, clamps, and appliances, as well as proper cutting-tools are on hand, and are used to set the work correctly in the machine and cut the metal at the right speed and feed; must see that each man keeps his machine clean and in good order; must see that each man turns out work of the proper quality; must see that the men under him work steadily and fast; must constantly look ahead over the whole field of work and see that the parts go to the machines in their proper sequence and that the right job gets to each machine; must, at least in a general way, supervise the time-keeping and fix piecework rates; must discipline the men under him, and readjust their wages.

Under functional management, the old-fashioned single foreman is superseded by eight different men, each of whom has his own special duties, and these men, acting as the agents for the planning department, are the expert teachers, who are at all times in the shop helping and directing the workmen. Being each one chosen for his knowledge and personal skill in his specialty, they are able not only to tell the workman what he should do, but in case of necessity they do the work themselves in the presence of the workman, so as to show him not only the best but also the quickest methods.

The following is a brief description of the duties of the four types of executive functional bosses which the writer has found it profitable to use in the active work of the shop: (1) gang bosses, (2) speed bosses, (3) inspectors, and (4) repair bosses.

The *gang boss* has charge of the preparation of all work up to the time that the piece is set in the machine. It is his duty to see that every man under him has at all times at least one piece of work ahead at his machine, with all the jigs, templets, drawings, driving mechanism, sling chains, etc., ready to go into his machine as soon

[1] Adapted by permission from F. W. Taylor, *Shop Management*, pp. 96–98, and *The Principles of Scientific Management*, pp. 100–125. (Harper and Brothers, copyright by author, 1911.)

as the piece he is actually working on is done. The gang boss must show his men how to set their work in their machines in the quickest time and see that they do it. He is responsible for the work being accurately and quickly set, and should be not only able to but willing to pitch in himself and show the men how to set the work in record time.

The *speed boss* must see that the proper cutting tools are used for each piece of work, that the work is properly driven, that the cuts are started in the right part of the piece, and that the best speeds and feeds and depth of cut are used. His work begins only after the piece is in the lather or planer, and ends when the actual machining ends. The speed boss must not only advise men how best to do this work, but he must see that they do it in the quickest time, and that they use the speeds and feeds and depth of cut as directed on the instruction card. In many cases he is called upon to demonstrate that the work can be done in the specified time by doing it himself in the presence of his men.

The *inspector* is responsible for the quality of the work and both the workmen and speed bosses must see that the work is all finished to suit him. This man can, of course, do his work best if he is a master of the art of finishing work both well and quickly.

The *repair boss* sees that each workman keeps his machine clean, free from rust and scratches, and that he oils it and treats it properly, and that all of the standards established for the care and maintenance of the machines and their accessories are rigidly maintained, such as care of belts and shifters, cleanliness of floor around machines and orderly piling and disposition of work.

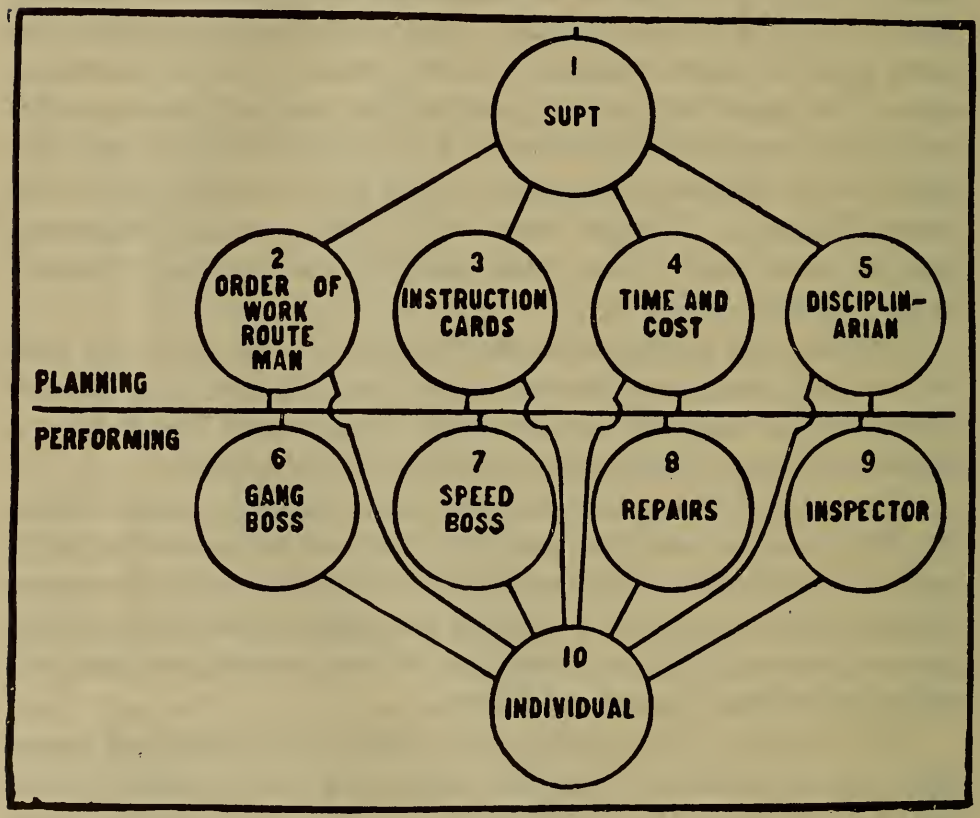
The following is an outline of the duties of the functional bosses who are located in the planning room, and who in their various functions represent the department in its connection with the men. The first three of these send their directions to and receive their returns from the men, mainly in writing. These four representatives of the planning department are the (1) order of work and route clerk, (2) instruction card clerk, (3) time and cost clerk, and (4) shop disciplinarian.

Order of work and route clerk.—After the route clerk in the planning department has laid out the exact route which each piece of work is to travel through the shop from machine to machine in order that it may be finished at the time it is needed for assembling, and the work done in the most economical way, the order of work clerk daily writes

lists instructing the workmen and also all of the executive shop bosses as to the exact order in which the work is to be done by each class of machines or men, and these lists constitute the chief means for directing the workmen in this particular function.

Instruction card clerks.—The "instruction card," as its name indicates, is the chief means employed by the planning department

DIAGRAM ILLUSTRATING THE PRINCIPLE OF FUNCTIONAL OR SCIENTIFIC MANAGEMENT[1]



for instructing both the executive bosses and men in all of the details of their work. This instruction card is filled in by one or more members of the planning department, according to the nature and complication of the instructions, and bears the same relation to the planning room that the drawing does to the drafting room.

Time and cost clerk.—This man sends to the men through the "time ticket" all the information they need for recording their time

[1] This diagram is taken by permission from F. B. Gilbreth, "Units, Methods, and Devices of Measurement under Scientific Management," *Journal of Political Economy*, XXI (1913), 619.

and the cost of the work, and secures proper returns from them. He refers these for entry to the cost and time record clerks in the planning room.

Shop disciplinarian.—In case of insubordination or impudence, repeated failure to do their duty, lateness or unexcused absence, the shop disciplinarian takes the workmen or bosses in hand, applies the proper remedy. He sees that a complete record of each man's virtues and defects is kept. This man should also have much to do with readjusting the wages of the workmen. At the very least, he should invariably be consulted before any change is made. One of his important functions should be that of peace-maker.

22. STAGES IN MANAGEMENT[1]

All types of management seem to fall into three general classes, which for want of a better terminology we shall call (1) unsystematized, (2) systematized, and (3) scientific.

Let us look briefly at the five important features of every manufacturing plant, excluding designing, advertising, and selling. These are: (1) accounting and costs; (2) purchasing; (3) storage of materials; (4) execution of the work; and (5) efficiency of the worker. [This selection will be confined to the discussion of the execution of the work.—Ed.]

Execution of work.—Orders in the unsystematized shop are recorded in a simple manner, sometimes even received and transmitted orally by the salesman. These are described in part orally to the superintendent, who may further enlighten the foreman on any of the details of such orders. It is assumed that the superintendent knows his business, that the foremen know theirs, and a workman is expected to sense what is wanted and to ask questions when he is not sure. In this way an attempt is made to fill in the exact and accurate information which the selling end either has not secured or has not transmitted in writing.

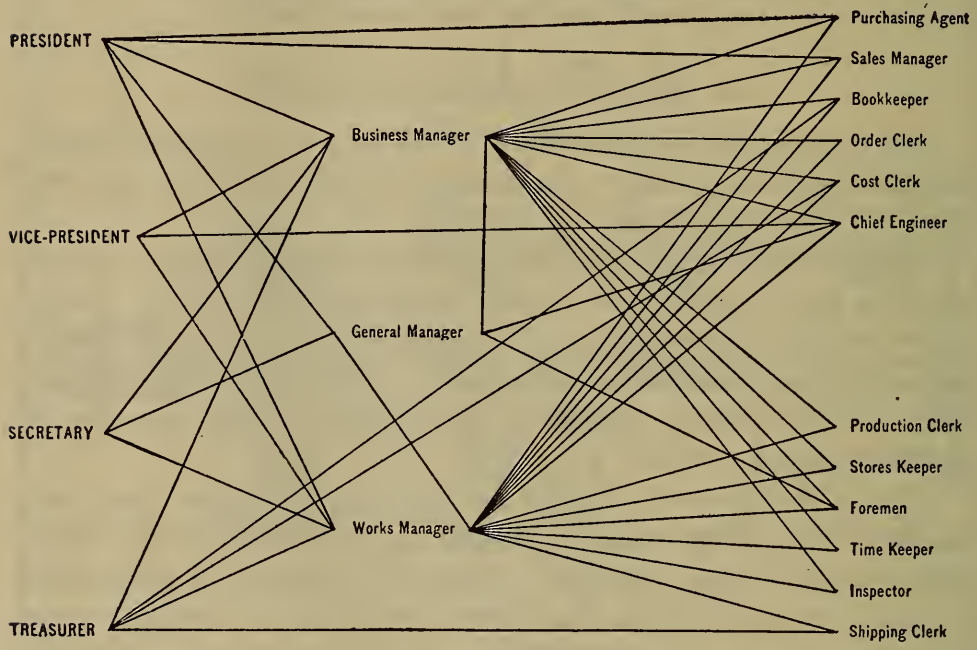
The "single foremanship" plan prevails where one foreman handles as many men as he can. The number of men and the amount of work he can look out for is limited by the amount of detail he can carry in his head and by his physical and nervous endurance. He gives work to each workman when the latter has finished his last job, and depends largely on the worker's knowledge of what to do and

[1] Adapted by permission from H. P. Kendall, "Systematized and Scientific Management," *Journal of Political Economy*, XXI (1913), 593–614.

how to do it. As questions arise in the progress of the work, or where the written order is incomplete, the workman goes to the foreman who in turn goes to the office for instructions. Meanwhile progress on the work stops.

The workman goes for and selects his tools and appliances, and does his work in the way in which he is accustomed to do that particular kind of work. A difference in method of doing the same kind

ORGANIZATION CHART ILLUSTRATING UNSYSTEMATIZED MANAGEMENT



of work by different workmen and in different shops is often quite marked.

In the systematized plant, this crude rule-of-thumb method has been changed. A complete set of order-cards for recording and transmitting orders is in use. The worker receives a written order for the work he is to do. But this seldom takes the form of an instruction card giving him complete information for every move and every tool. It is likely to say *what* the work is, assuming that he will do it in a satisfactory manner. Workers almost always record their time for each job on a card, which registers the labor cost accurately. They do not always register the time lost in securing tools, materials, and further instructions. The planning of a job, except in plants where

the work is very largely repetition, is likely to be done as the work proceeds. Piecework is used wherever possible and is considered the most economical way of performing a given operation. It is the aim of most systematized plants to secure as much piecework as possible. This may be unfair for different kinds of work to both employees and employer.

Systematized management keeps things running smoothly, avoids most of the mistakes due to the lax methods of unsystematized management, and turns out a good product. But a lack of centralized planning and centralized control of the workers causes loss of efficiency. This is especially true in rush times, or when certain parts of a factory are congested. It is impossible, then, with the means at hand, so to plan the work as to get it out to the best advantage; for with the foreman of one room or department planning his work, and another his, the two can seldom be made to interlock perfectly.

The theory of the proper execution of work under scientific management is that it should be planned completely before a single move is made—that a route-sheet which will show the names and order of all the operations which are to be performed should be made out and that instruction cards should be clearly written for each operation. Requisitions on the stores department showing the kind and quality of the materials and where they should be moved, and lists of proper tools for doing the work in the best way, should be made up for each operation. Then by time-study the very best methods and apparatus for performing each operation is determined in advance and becomes a part of the instruction cards.

By this means the order and assignment of all work, or routing, as it is called, should be conducted by the central planning or routing department. This brings the control of all operations in the plant, the progress and order of the work, back to the central point. Information which even in the systematized plant is supposed to be furnished by the knowledge of the workman or the gang-boss or foreman is brought back to the planning room and becomes a part of the instruction card.

Under scientific management the efficiency of the worker and machine depends on five other conditions, after assuming that the parts of the management which have to do with purchasing, storage of materials, etc., are well performed. These conditions are: (1) analysis and synthesis of the elements of operation; (2) scientific

selection of the worker; (3) training of the worker; (4) proper tools and equipment; (5) proper incentive. All these conditions it is the duty of the management to provide.

See also p. 374. Purchase and Stores under Unsystematized, Systematized, and Scientific Management.

23. CONTROL OF MANUFACTURE UNDER THE TAYLOR SYSTEM[1]

The production of anything consists of three stages:

a) Determining *what* is to be produced—what materials are to be used and their disposition in the article to be produced. This is the function of the engineering or designing department.

b) Determining *how* it is to be produced and *when* the various steps incident to its production are to be taken. This is the function of the planning department.

c) Performing the physical work in accordance with the plans of the designing and planning departments. This is the function of the manufacturing department.

Obviously the planning department is the logical complement of the engineering or designing department. Briefly stated its functions are so to plan and control the processes of production that the personnel and the facilities of the plant, physical and financial, will be utilized to the best and fullest advantage, that the work will be done correctly and economically and that deliveries will be made on time.

In the planning department is assembled practically all of the clerical work which in a plant run under old style management is done here and there in the manufacturing departments, either by clerks, the foremen or even the workmen themselves. It is the repository of all data and working records required for the planning and control of work done in the plant.

The basic data required for the planning department should include:

a) *Data relating to product and materials.*—Drawings and bills of materials of the product (or their equivalent which in some cases may take the form of samples or patterns).

[1] Adapted by permission from H. K. Hathaway, "On the Technique of Manufacture," *Annals of the American Academy of Political and Social Science*, LXXXV (1919), 149–55.

Specifications for both the product and the materials entering thereinto. This class of data should cover all of the information with respect to the product that may be needed in planning or in its manufacture.

b) *Data relating to plant equipment.*—Complete information with respect to each machine, its capacity, speeds, adjustments, classes of work or operations to which suited, location, etc. Similar data with respect to work places other than machines, tools and appliances, etc. This class of data should be so complete that work may be planned with a full knowledge of, and in accordance with the manufacturing facilities, in such a way as to make the best use of the plant and its equipment.

c) *Elementary time study data.*—"Unit times" covering all of the elementary operations entering into the processes of manufacture, the adjustments and operation of machines, the use of the various tools and appliances, allowances for fatigue, for changing time cards upon the completion of each job, for inexperience of new operators, for variations in quantities, etc. In short, all of the data necessary to the compilation of detailed instruction cards for any operation to be performed, indicating the method to be followed and the time that the job should take under the standard conditions that have been established.

There are also built up and maintained for products that have been manufactured, files of route charts or diagrams, route sheets, instruction cards and tool lists which will be described farther on.

The active records of the planning department consist principally of the progress sheets (or charts) and the route sheets on which the progress on the various orders in process of manufacture is recorded and the "Balance of Stores and Worked Materials" sheets (stock ledgers or perpetual inventory) which show for each item of purchased or manufactured materials carried in stock, the quantity on hand, the quantity on order but not yet received in stores, the quantity required for (apportioned but not yet issued to) manufacturing orders or shipping orders that have been issued and the balance available for use on future orders.

From this point perhaps it will be best to describe the processes that take place in the planning department from the time that a manufacturing order has been issued and the necessary drawings, bills of materials, specifications or samples provided, describing each

stage in the process of planning and the manner in which the work is controlled as it progresses through the shop.

Routing and duties of the route clerk.—The manufacturing order together with all data relating to design, etc., is turned over to the route clerk who plans in detail for each unit or article to be produced for the manufacturing order:

a) The quantities of each kind of material required for each different part.

b) Whether these materials are to be taken from stock on hand in the store-room or procured especially for the order.

c) Whether the part or article is something to be manufactured from material on hand or to be procured or is to be drawn from manufactured stock on hand in the store-room.

d) If the part or article is to be manufactured, the operations which must be performed in order to convert the primary material into the finished article, the sequence in which these operations must be taken up, the machine or work place best suited to the performance of each operation.

If the product called for by the manufacturing order consists of a number of parts to be assembled together after having been manufactured or drawn from the store-room, the route clerk prepares a diagram or route chart showing graphically the manner in which the various parts are to be assembled into groups or sub-assemblies and the manner in which the various groups or sub-assemblies are to be assembled to bring about the completed machine or article, the relation of the several parts and groups to each other, the relative importance of each part and group as a guide in determining the order in which the work should be prosecuted in the shop so as to have those parts requiring the greatest time to produce finished as nearly as possible simultaneously with all other parts. Likewise on the charts he shows all of the information previously described.

For each unit to be manufactured, that is to say, for each part, for each group of parts to be assembled and for the assembling of the completed article, a route sheet is prepared giving the information above referred to in such a manner that the progress of the work may be recorded and regulated as it goes through the shop. He also causes to be prepared the orders on the store-room (stores issues) for the primary materials and stock parts.

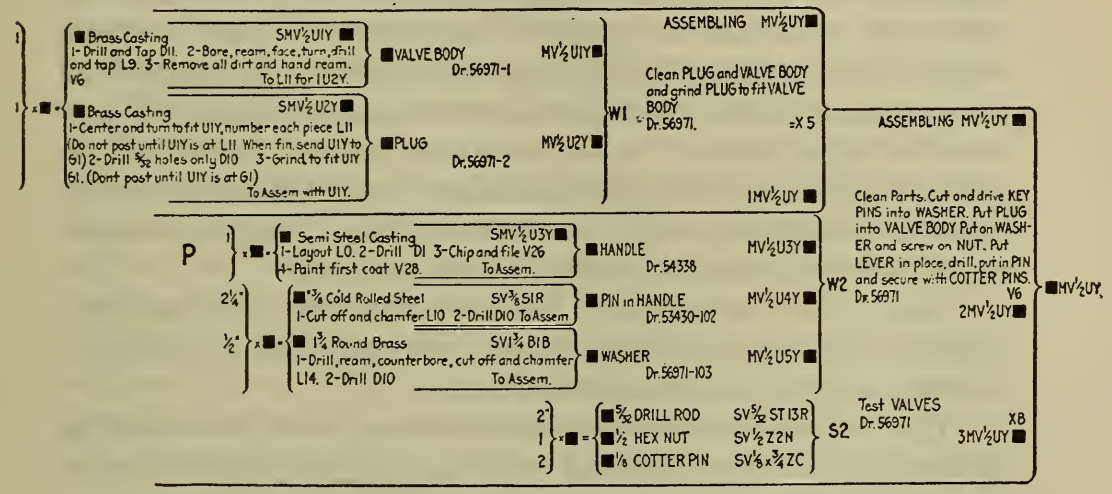
Based upon the route sheets there are prepared by typists all of the orders relating to each of the several operations on each piece

or assembled unit that will be required as the work progresses. These include:

a) *Move orders* issued to men whose sole duty it is, on the orders of the planning department, to move materials from place to place in the shop.

b) *Time cards* which are issued to the workmen at the start of each job and serve the purposes of recording progress of work on the route sheets, making up the pay-roll and of cost keeping.

ROUTE CHART FOR SPECIAL VALVE[1]



c) *Operation orders* to be used in planning the work ahead for each of the machines and work places throughout the shop serving as an index to the detailed instruction cards and tool lists relating to the respective operations, indicating the machine at which the work is to be done and the time which it should take.

d) *Inspection orders* which are issued to the inspector, in some cases for each operation, advising him of the start of each job in order that he may give the workmen such instruction as may be necessary to insure a proper understanding of the requirements as to accuracy, quality, etc., and that he may check the work up as it progresses to guard against carelessness or errors.

e) *Identification tags* to be attached to the various parts and materials.

The route sheets are attached to portfolios or to sheets of heavy paper containing a series of envelopes in which the move orders,

[1] Adapted by permission from H. K. Hathaway, "Routing Considered as a Function of Up-to-Date Management," *Industrial Management*, LX (1920), 354.

time cards, operation orders, etc., referred to above and the instruction cards and tool lists for the various operations are placed in such a manner as to be readily accessible when wanted. The route sheets with their portfolios are later placed in suitable files indexed to facilitate finding any sheet desired.

The balance of stores clerk.—The next step in the planning is to send the manufacturing order accompanied by its route sheets, stores, and work materials, issues, etc., to the balance of stores clerk who will make sure that adequate provision has been made for the materials required either through their being on hand in the store-room or on order. He apportions to the order the quantities of each material required, subtracting it from the quantities shown to be available on the respective balance sheets, and as the balance available falls as a result of apportionment to the minimum quantity established he issues requisitions on the purchasing agent for purchased materials or issues manufacturing orders for manufactured or worked material parts. Thus the stock is automatically maintained.

Later on as the material is actually withdrawn from the store-room the balance of stores clerk also subtracts from the quantity shown to be on hand the materials issued.

The balance of stores clerk co-operates closely with the accounting department, his sheets carrying values as well as quantities are in fact details of the stores and manufactured product accounts.

Time study and instruction card man.—The manufacturing order with its route sheets, etc., next is delivered to the time study and instruction card clerk whose duty it is to draw up for each operation an instruction card describing in detail just what the operation consists in, the method to be followed and the implements to be used, and to fill in for each one of the elementary operations making up the operation as a whole the time as shown by his elementary time study data.

The time study man in preparing an instruction card must have readily available complete information relating to each of the machines in the shop, and what tools and implements are available.

He must also have properly tabulated all of the elementary time units which may enter into work to be done. With this data and the drawings and specifications before him giving all of the information relating to the product to be worked upon, he prepares the instruction card for each operation enumerating every elementary step which he would take if he were to perform the operation himself.

Simultaneously with preparing the instruction card which of course must indicate any implements to be used, a tool list specifying them is prepared, and should it be found that any new tools are required, the person preparing the instruction card must arrange for their purchase or manufacture. In short, the instruction card writer must assure himself that all of the conditions upon which he bases the method and time prescribed will exist when the work is undertaken.

Of course, it is not necessary in every instance to prepare a new instruction card for each operation on each manufacturing order passing through the planning department. Many jobs, or parts of jobs, are simply repetitions for which instruction cards already exist.

These cards show in summarized form the time for preparation at the start of the job, for cleaning up at the finish, the time per unit or piece, and the percentages of allowance for fatigue, inertia, etc., which may vary with the number of pieces in the lot. From this information the time for each operation is computed and entered on the time cards, operation orders and route sheets.

The time study man and the route clerk must co-operate closely with each other. The time study man is also frequently consulted by the designing department and in fact in many businesses no new article is added to the line until it has been submitted to the time study man and the cost determined on a basis of his figures as to the amount of work involved. Until active co-operation is established between the planning department and the designing department of a business it may be said that the full benefits of scientific management are not realized.

With the placing of the completed route sheets together with their operation orders, time cards, instruction orders, tags to be attached to the material for identification, etc., in the route files the work of planning *what is to be done* may be said to be completed and we now enter into the second stage of the planning department's activities—the planning of *when* work is to be done.

This is carried on by the *production clerk* (sometimes called production superintendent or production manager) with certain assistants known as the *planning department order of work clerk* and the *shop order of work clerk.*

It is the function of the production clerk to see that work is completed in such time as to satisfy the needs of the sales department or in the case of stock parts, the needs of the shop. It is also his duty

to see that all machines and work places in the shop are adequately supplied with work and continuously employed. This the production clerk does by maintaining what is termed a "balance of work" showing the amount of work of each class ahead of the shop, subdivided by classes of machines or operations and further by time periods. This is kept up by adding the time represented by manufacturing orders as they are entered, and subtracting as the work is performed.

The production clerk arranges the "order of work" or schedule indicating the order of preference to be given to each of the various manufacturing orders started out. This schedule must of course take into account the amount of work to be done and the time when the order must be finished. It serves as a guide to the planning department order of work clerk in arranging for the progress of an order through the various stages of planning and also for the shop order of work clerk in starting orders out in the shop and in laying out the work ahead for each of the machines and work places. The production clerk must each day check up the progress being made on the various manufacturing orders going through the planning department and in the shop to assure himself that his assistants are correctly following out his instructions. He must also take care of the exceptional or emergency orders coming in from time to time and instruct his assistants as to the action to be taken where things have not worked out as planned.

The planning department order of work clerk.—While strictly speaking the planning department has no one person at its head, that is, in the sense of the old time boss of a department, the planning department order of work clerk may in a certain measure be regarded as being its head. He is responsible for work proceeding through the planning department without delay, for the work of each of the functions being kept up to date and in case of any failure to do so it lies with him to initiate and follow up such action as may be necessary to correct the trouble. Naturally he cannot be responsible for the quality of the work done by the route clerk or the time study man nor give them orders as to *how* work shall be planned, but he is responsible for seeing that these and all other functions in the planning department are adequately manned and that the personnel attend to business.

He must indicate to each of the people in the planning department the order in which they are to undertake the work ahead of them and

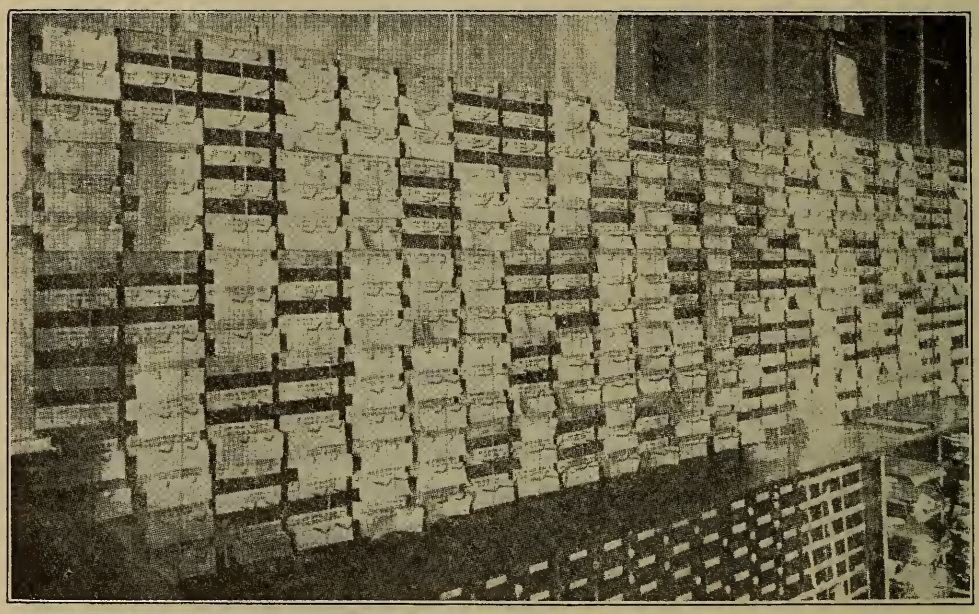
he must advise them as to the time when each order must be completed so far as their respective part of the planning is concerned. He must maintain such records as will enable him at any time to locate any order that is going through the planning department and he must see that orders move from one planning function to another without delay. In addition to the follow up manufacturing orders going through the planning department, he must also look after the planning for the correction of any damaged or defective work reported by the inspectors as well as for the planning of any changes in work already in process.

Shop order of work clerk.—The shop order of work clerk really controls the operation of the shop, the mechanism through which he does this being the bulletin board, and the route files. He has as assistants, the window clerk, who receives time cards, move orders and inspection orders as work progresses and issues to the workmen, movemen and inspectors these orders for their next jobs; the recording clerk, who upon receipt of a time card, move order or inspection order pertaining to work that has been done indicates the progress by checking on the appropriate route sheet, removes the operation order for finished work from the bulletin board, issues through the window clerk the time cards for jobs to be started, the move orders for jobs that have been finished and inspected, inspection orders for jobs started, etc. He also has an assistant generally termed the messenger, who delivers to workmen the drawings, specifications, samples or other information as well as instruction cards and tool lists pertaining to work ahead.

On starting an order out in the shop, the shop order of work clerk arranges the operation orders for the first operations (on the parts for which material is available) on the bulletin board for the machines or work places concerned, in the order indicated by his order of work or schedule, with respect to other jobs already ahead of machines, or work places in question. He also sees that the moving of materials as well as the work of the inspectors is controlled in accordance with the order of work and kept up to date. As jobs progress from one operation to another he arranges on the bulletin board, the operation orders for each successive step in accordance with the order of work.

Another important duty of the shop order of work clerk is to check up or to follow up through the route sheets the progress of work on all manufacturing orders, assuring himself that they are progressing at such a rate as will insure their completion in their proper order and

by the time required; to bring to light any cases where the lack of materials or tools have prevented the progress of work, and above all to detect any cases where through error delays have occurred, or where the operation orders for work have not been arranged on the bulletin board in accordance with the order of work. In every instance where he finds any condition which is not right he must initiate and follow up the necessary action to correct the trouble.



PLANNING DEPARTMENT BULLETIN BOARD[1]

For each machine or work place in the shop there are three pairs of hooks. The "1st hooks" hold the operation order for the job in progress stamped with the time started; under it is hung a slip or tag giving the name of the operator and showing the machines he is qualified to run or classes of work he can do. If the machine is idle a slip of distinctive color and wording showing the reason such as "No operator," "Operator absent," "Machine under repair," etc., is placed on the "1st hooks." The "2nd hooks" hold the planning department copies of operation orders for jobs ready to be done—for which the materials have been moved to the machine or work place—or into an adjacent storage space or "truck station" serving a group. The "3rd hooks" hold operation orders for jobs ahead not yet ready to be done—i.e., having preceding operations yet to be performed or waiting for materials to be issued.

Another form of bulletin board has "pockets" or compartments taking the place of hooks. Both are developments of Mr. Taylor's and Mr. Barth's.

He is responsible for seeing that each machine or work place is kept properly supplied with work and for bringing to the attention of the production clerk any case where there is an excess or a shortage. In cases of break-downs of machinery or anything going wrong he

[1] Adapted by permission from H. K. Hathaway, "Routing Considered as a Function of Up-to-Date Management," *Industrial Management*, LX (1920), 284.

must see that whatever action may be necessary is taken to correct the trouble.

See also p. 565. The Control Problem Varies with Different Types of Industry.
p. 354. An Organization of the Sales Department.

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24. STEPS IN INSTALLING THE TAYLOR SYSTEM[1]

A logical course of installation would be somewhat along the following lines:

1. *General plan of organization*, designing departments and subdivisions thereof, defining authority, the nature, scope and limitations of their activities and the relations and responsibilities of each department to others. Such a plan, with its mnemonic classification, also serves as a basis for a model accounting and cost system, for a classified file of "standing orders" (a handbook) governing all manner of duties, activities and transactions.

Of course, a change cannot be affected all at once from the haphazard organization to the new, even though all parties might concede its desirability. It must be brought about gradually in order to avoid friction or confusion. Nevertheless from the start it is highly desirable to have a plan which may be regarded as an ideal toward which we should work.

2. *Plan for physical rearrangement* of departments and equipment, including provision of space for new departments and in accordance with the prospective general plan of organization. This should result in lowered cost for supervision, better utilization of space, economy in tools, cheaper handling, etc. An ideal plan of rearrangement must be brought about step by step extending over a long period of time and only as the installation of the new scheme of management progresses.

The advantages resulting from common services such as repair, tool room, drafting department, storeroom, cost-keeping and time-keeping will be so obvious as to require no further comment.

3. *The collection and codification of data relating to the products.* In machine-shop work this consists in improving the draughting practice along lines that will facilitate planning and performance of

[1] Adapted by permission from H. K. Hathaway, "Logical Steps in Installing the Taylor System of Management," *Industrial Management*, LX (1920), 93–96.

work and provide safeguards against mistakes. In lines other than those which commonly work from drawings these data take the form of specifications, working samples, gages, etc. It is surprising to find that in many plants data relating to products are either incomplete, inaccurate or existing only in the heads or personal notebooks of the employees. Even in machine shops and similar industries where drawings and bills of materials are supposed to be complete and satisfactory, they will usually be found to fall far short of what is required under scientific management.

While this is being done, that part of the mnemonic classification relating to products should be worked up, at least so far as the main classes are concerned. This will be needed later in connection with routing, filing of data and instructions, store-keeping and cost-keeping.

4. *The collection and codification of data relating to machinery and other plant equipment.* This should cover all such information relating to equipment as may be needed for purposes of standardization of machines, tools, etc., for planning work in advance, for establishing machine rates and for maintenance purposes. That part of the mnemonic classification relating to plant equipment should be worked up.

5. *Standardization of machines and development of maintenance system.*[1]

6. *Standardization of tools and establishment of tool-room.*[1]

7. *The development of the stores system.* This should cover on the one hand physical arrangement of storeroom, methods of storages, centralization of administrative control and all other phases of store-room operation for both purchased and manufactured materials, the former commonly being called "stores" and the latter "worked materials stores." On the other hand, it should cover the establishment of balance of stores and balance of worked material sheets and their operation as a function of the planning department. This involves working up that portion of the mnemonic classification covering purchased and worked materials carried in stores and the determination of "minimum" and "ordering" quantities for each article.

Together with this must be made such modification in the purchasing system, receiving materials, the auditing and vouchering of

[1] In many cases this work may only be done in a preliminary way to be further developed as a result of time study.

accounts payable for materials, as may be necessary to make these activities fit in with the stores system and the later development of other features of the new scheme of management.

8. *Development of the order system.* The system and forms for handling shipping orders (orders from customers) must be revised to fit in with the stores system, providing for the apportionment of stock products and as a result thereof the issue of manufacturing orders or purchase orders for the replenishment of stock or the procurement or manufacture of products not carried in stock.

A system of manufacturing orders must be established or the existing one modified so that it will fit in with the stores system, enabling apportionment in advance to each manufacturing order, of the purchased or worked materials required, thus insuring their being provided for and on hand when wanted, and the stock of each article replenished at proper intervals. All work done must be authorized by manufacturing orders, and pending the establishment of the routing system and the mechanism for the administration of the order of work function, some temporary plan for keeping track of and recording progress should be provided in order that control (the order of work function) may be exercised, while still imperfectly, better than may previously have been possible. Existing mechanism, forms, etc., may often be made to serve until such time as the more permanent scheme may be worked out and put into effect, thus making the change less radical or abrupt. Whatever may be done along these lines should be so worked out and planned as to meet the new requirements of all other functions such as cost-keeping, accounting, planning, purchasing, etc., as they may be developed and installed.

9. *The time-keeping system* must be so modified as to serve all of the purposes of accounting such as cost-keeping, pay-roll and analysis of indirect expenses, and in addition thereto provide the necessary data for employees' records, records of idle machine time, and above all automatically to provide the up-to-the-minute information that will be needed by the planning department in recording progress of work on manufacturing orders and for the operation of the mechanism through which the order-of-work function is exercised.

10. *The routing system*, including the complete planning in advance of the work to be done in turning out the product called for by each manufacturing order issued and the provision of the various forms, etc., used in putting the work so planned through the plant.

11. *The establishment and use of the mechanism for follow-up and control of work in progress*, order-of-work function in its complete detail comprising "bulletin boards" for the planning department and shop, operation orders, inspection orders, move orders, the means for their issue and return and route sheets and progress sheets to control their use and record each successive step in the accomplishment of work planned. At this stage would also be started the "balance of work" and other activities having as their object the fullest possible utilization of plant facilities and equalization of temporary overloading in certain quarters. Usually about this time the need for co-operative effort along new lines by the sales department becomes evident.

At about this stage in our work, although it may have been found desirable to have done so sooner, the functional foreman known as the gang boss and the inspector should be inaugurated. The gang boss to look after preparation for each successive job and see that the order of work is followed and the inspector to give such instruction and supervision as may be required in the matter of quality.

12. *Time study, the improvement and standardization of methods* and the inauguration of a pay system based thereon involving the payment of a suitable reward for the accomplishment of a given production under standard conditions in a given time logically should be taken up now that a proper foundation has been built for them. Unfortunately this is where in the past too many efforts to apply and profit by Taylor's teachings have commenced and have consequently either ended in failure or have fallen far short of the desired results.

As a result of time study, the work of standardization of tools, machinery, etc., started early in the installation will be carried much farther.

At this stage the functional foreman known as the instructor should be established. It is his duty to teach the methods developed and prescribed by the planning department, giving special attention and assistance to the less skilled and less experienced workers. This is the function which Mr. Taylor in *Shop Management* refers to as the "speed boss."

13. *Cost and accounting system.* The stores system, the time-keeping system, the manufacturing order system and the routing system have all been developed in such a way as to lend themselves to the requirements of cost-keeping and accounting, serving not only the purposes of planning, control, etc., but supplying the basic data in readily usable form for the analysis and distribution of indirect

expenses for obtaining promptly and with a minimum of effort the cost of each lot of product in as great detail as may be desired and the determination of the profits or losses on each month's business as incurred and on each class of product. The establishment of the cost system is, therefore, at this stage relatively easy. Such changes as may be necessary in the general books and the system of keeping them must also be made to connect them up with the rest of the system.

25. SCIENTIFIC MANAGEMENT AND LABOR[1]

A. THE CLAIMS OF SCIENTIFIC MANAGEMENT

Fundamental principles of scientific management.—Scientific management rests on the fundamental economic principles that harmony of interests exists between employers and workers, and that high general wages and better general conditions of employment can be secured through low labor cost.

The relation of scientific management to fact and law.—Scientific management attempts to substitute in the relations between employers and workers the government of fact and law for the rule of force and opinion. It substitutes exact knowledge for guesswork and seeks to establish a code of natural laws equally binding upon employers and workmen.

The scientific and democratic character of scientific management.—Scientific management is thus at once scientific and democratic. In time and motion study it has discovered and developed an accurate scientific method by which the great mass of laws governing the easiest and most productive movements of men are registered. These laws constitute a great code which for the first time in industry completely controls the acts of the management as well as those of the workmen. It pays men rather than positions and through its methods of payment makes possible the rewarding of each workman on the basis of his efficiency. It makes possible the scientific selection of workmen, i.e., the mutual adaptation of the task and the worker, and is a practical system of vocational guidance and training. It analyzes the operations of industry into their natural parts, makes careful studies of fatigue, and sets the task on the basis of a large number of performances by men of different capacities and with due and scientific allowance for the human factor and legitimate

[1] Adapted by permission from R. F. Hoxie, *Scientific Management and Labor*, pp. 8–19. (D. Appleton and Company, 1916.)

delays. It assigns to each workman a definite and by him accomplishable task, institutes rational rest periods and modes of recreation during the working hours, eliminates pace-setters, standardizes performance, and guards the workers against overspeeding and exhaustion, nervously and physically. It substitutes the rule of law for the arbitrary decisions of foremen, employers, and unions, and treats each worker as an independent personality.

Scientific management thus democratizes industry. It gives a voice to both parties and substitutes joint obedience of employers and workers to fact and law for obedience to personal authority. No such democracy has ever existed in industry before.

Scientific management and productive efficiency.—Scientific management improves and standardizes the industrial organization and equipment, betters the training of the workmen, and increases their skill and efficiency. It rationalizes the management, improves the methods of planning, routing, and accounting, furnishes the best machinery, tools, and materials, eliminates avoidable wastes, and standardizes the methods of work; gathers up, systematizes, and systematically transmits to the workers all the traditional craft knowledge and skill which is being lost and destroyed under current industrial methods; employs in the shop a corps of competent specialists whose duty it is to instruct and train the workers and to assist them whenever difficulties arise in connection with the work; trains the men in the easiest and best methods of work and brings the workmen into close and helpful touch with the management; removes from each worker responsibility for the work of others and prevents the more efficient from being held back and demoralized by the inefficient; increases the productive output; and improves the quality of the product.

Scientific management and labor welfare.—Scientific management, through its accurate scientific methods and the laws which it has discovered and established, its improvement of organization and equipment, and its democratic spirit, sets each workman to the highest task for which his physical and intellectual capacity fits him and tends to prevent the degradation and displacement of skilled labor; rewards the men for helpful suggestions and improvements in the methods of work and provides immediate inspection and immediate rewards for increased or improved output; requires the workers to perform, not one operation merely, but several operations or tasks; trains the workmen mechanically as they were never trained before,

opens the way for all workmen to become "first-class men," and opens up opportunities for the advancement and promotion of the workers; stimulates and energizes them intellectually and promotes their self-reliance and individuality; insures just treatment of individual workers and pays to each in proportion to his efficiency; and guarantees the worker against the arbitrary alteration of the task, arbitrary rate cutting, and limitation of earnings. It raises wages and shortens the hours of labor; increases the security and continuity of employment; and lessens the rigors of shop discipline. It promotes friendly feeling and relations between the management and the men, and among the workers of the shop or group; renders collective bargaining and trade unionism unnecessary as means of protection to the workmen; and tends to prevent strikes and industrial warfare and to remove the causes of social unrest.

B. THE TRADE UNION OBJECTIONS TO SCIENTIFIC MANAGEMENT

"Scientific management" is a device employed for the purpose of increasing production and profits and tends to eliminate consideration for the character, rights, and welfare of the employees. It looks upon the worker as a mere instrument of production and reduces him to a semi-automatic attachment to the machine or tool. In spirit and essence, it is a cunningly devised speeding-up and sweating system which puts a premium upon muscle and speed rather than brains; forces individuals to become "rushers" and "speeders"; stimulates and drives the workers up to the limit of nervous and physical exhaustion and over-speeds and over-strains them; shows a constant tendency to increase the intensity and extent of the task; tends to displace all but the fastest workers; indicates a purpose to extract the last ounce of energy from the workers; and holds that if the task can be performed it is not too great.

It intensifies the modern tendency toward specialization of the work and the task; is destructive of mechanical education and skill; splits up the work into a series of minute tasks tending to confine the workers to continuous performance of one of these tasks; tends to eliminate skilled crafts; deprives the worker of the opportunity of learning a trade; degrades the skilled workers to the condition of the less skilled; displaces skilled workers and forces them into competition with the less skilled, and narrows the competitive field and

weakens the bargaining strength of the workers through specialization of the task and the destruction of craft skill.

It displaces day work and day wage by task work and the piece-rate, premium, and bonus systems of payment. It tends to set the task on the basis of "stunt" records of the strongest and swiftest workers without due allowance for the human element or legitimate delays, so that only a few of the strongest and most active workers are capable of accomplishing it, and has devised and established modes of payment, usually arranged so that it is greatly to the advantage of the employer to prevent the workers from equaling or exceeding the task, and which usually result in giving the worker less than the regular rate of pay for his extra exertion and only a portion and usually the smaller portion of the product which his extra exertion has created.

It establishes a rigid standard of wages regardless of the progressive increase in the cost of living, and tends to make it permanent at its present low level; puts a limit upon the amount of wages which any man can earn; offers no guaranty against rate-cutting; is itself a systematic rate-cutting device; tends to lower the wages of many immediately and permanently, and means in the long run more work for the same or less pay.

It tends to lengthen the hours of labor; shortens the tenure of service; lessens the certainty and continuity of employment; and leads to over-production and the increase of unemployment. It condemns the worker to a monotonous routine; tends to deprive him of thought, initiative, sense of achievement and joy in his work; dwarfs and represses him intellectually; tends to destroy his individuality and inventive genius; increases the danger of industrial accidents; tends to undermine the worker's health, shortens his period of industrial activity and earning powers, and brings on premature old age.

It puts into the hands of employers at large an immense mass of information and methods which may be used unscrupulously to the detriment of the workers, creates the possibility of systematic blacklisting, and offers no guaranty against the abuse of its professed principles and practices.

Scientific management in its relation to industrial democracy.—"Scientific management" is undemocratic; it is a reversion to industrial autocracy which forces the workers to depend upon the employers' conception of fairness and limits the democratic safeguards of the workers. It tends to gather up and transfer to the management all

the traditional knowledge, the judgment, and the skill of the workers, and monopolizes the initiative and skill of the workers in connection with the work. It allows the workmen ordinarily no voice in hiring or discharge, the setting of the task, the determination of the wage rate, or the general conditions of employment; greatly intensifies unnecessary managerial dictation and discipline; tends to prevent the presentation and denies the consideration of grievances; and tends to increase the number of shop offenses and the amount of docking and fining; and introduces the spirit of mutual suspicion and contest among the men, and thus destroys the solidarity and co-operative spirit of the group. It has refused to deal with the workers except as individuals; is incompatible with and destructive of unionism; destroys all the protective rules established by unions and discriminates against union men; and is incompatible with and destructive of collective bargaining.

The unscientific character of scientific management.—"Scientific management" in its relation to labor is unscientific. It does not take all the elements into consideration but deals with human beings as it does with inanimate machines. It violates the fundamental principles of human nature by ignoring habits, temperaments, and traditions of work, and tends to minimize the acquired skill of the workers; greatly increases the number of "unproductive workers," i.e., those engaged in clerical work, and often squeezes out of the workers vast overhead charges; is unscientific and unfair in its determination of the task and furnishes no just or scientific basis for calculating the wage rate; and concerns itself almost wholly with the problem of production, disregarding in general the vital problem of distribution, and violates and indefinitely postpones the application of the fundamental principle of justice to distribution. It is based on the principle of the survival of the fittest and tends to disregard the physical welfare of the workers.

The inefficiency of scientific management.—"Scientific management" is fundamentally inefficient. It does not tend to develop general and long-time economic efficiency. It tends to emphasize quantity of product at the expense of quality, and to reduce the quality of the work and output. It is incapable of extensive application, and is a theoretical conception already proved a failure in practice.

Scientific management and industrial unrest.—"Scientific management" intensifies the conditions of industrial unrest. It libels the

character of the workmen, and its methods are evidence of suspicion and direct question of the honesty and fairness of the workers; fails to satisfy the workers under it, but, on the contrary, is regarded by them with extreme distaste; pits workman against workman, displaces harmony and co-operation among the working group by mutual suspicion and controversy, and increases the antagonism between the workers and their employers; and increases the points of friction and offers no guaranty against industrial warfare, and is conducive to strikes.

REFERENCES FOR FURTHER STUDY

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CHAPTER VII[1]

THE ADMINISTRATION OF RISK-BEARING

Purposes of this chapter:

1. To catch a glimpse of the social philosophy back of the position of the modern entrepreneur as a risk-bearer.

2. To get a working idea of the ways in which risks may be met, and especially to see the work of the administrator in this field.

In our organization of society the owner of private property is in a position, through exchange, to command social energy, the comprehensive term for land, labor, capital, and organization. When he engages in business enterprise he assumes the direction of social energy, and society, in effect, says to him: "If you command social energy well—that is, if you produce something for which we are willing to pay more than the price at which we value the social energies you use—you will reap a reward in profits; if you command poorly, no matter whether your failure is due to your own fault or to other conditions which you cannot foresee or control, you will be punished by loss. Society uses this method of stimulating individual initiative in the production of goods and services which may be applied to want-gratification."

We are not here concerned with the question whether this is good social organization. It suffices for us that our society is operated on this basis and that the owner of private property is, in business enterprise, put in a position to receive rewards and punishment. He "assumes the risks" of business, we say, but we do not mean that he assumes all the risks of business (for example, labor assumes some risks also) and we do not mean that the rewards and punishments are necessarily unlimited in amount. Society feels free to limit the rewards (for example, by excess-profit taxes) and to limit the punishments (for example, by the limitation of the liability of the owners of a corporation) if it believes that such limitation makes for social good.

[1] Prepared by Professor C. O. Hardy.

After all necessary qualifications have been set forth, it remains true that the entrepreneur is a "risk-taker," and our task is that of seeing what this means and how risk-bearing is administered.

A. The Character of Business Problems and Business Judgments

Throughout our study of the work of the business manager, emphasis has been placed on the importance of careful planning based on exact information. Business management has been treated as an applied science, or rather as the application of many sciences to the control of business relationships, and much stress has been laid upon the value of training in the accumulation, organization, and interpretation of significant facts upon which to base our judgments. In all this there is of course no implication that the business manager occupies a unique position. The increasing importance of science in business is merely one illustration of its increasing importance in all human affairs.

Nor is it intended to imply that the scientific method is the only available method. Nearly everywhere, in addition to the scientific method, we see also examples of the so-called practical approach to problems. Educators may depend for guidance each on his own common sense and experience, or may rely on the results of pedagogical research. Some preachers exemplify uninstructed insight, others education; one musician may display the effectiveness of training, another the inspiration of genius; the pugilist may win by sheer physical superiority or by science and strategy. Each method has its place. There is no disposition here to belittle the achievements of untrained genius and of common sense.

As civilization advances the relative importance of science grows. On the one hand, the mass of accumulated information and experience requires more study and more specialization for its mastery; on the other hand, the complexity of the problems to be handled, the magnitude of the enterprises to be controlled, make such mastery ever more necessary. Just as in the latter part of the Middle Ages the trained lawyer gained control of the administration of justice, and a little later the physician wrested physic from the barber, so in the nineteenth and twentieth centuries the construction engineer supplants or directs the rule-of-thumb contractor, the works engineer who grew up in the plant gives way to the engineer with technical training, the trained nurse ousts the "practical nurse."

The same factors which have brought about the development of scientific method in other fields have been operative in the field of business management, and here as in other fields the recognition of the value of exact knowledge and intelligent planning, though recent, has been very rapid. Whether the problem in hand is that of choosing a location, promoting an official, canceling a purchase order, refunding a bond, or writing an advertisement, the business manager has a choice of the two methods of procedure—snap judgment based on tradition, personal experience, haphazard information, and the circumstances of the moment, or careful judgment based on investigation of all the available data. So far as may be, he should rely upon the latter. One of the principal functions of this course, indeed, is to indicate the value in business of modern methods of scientific analysis as developed by students of psychology, geology, physics, economics, statistics, and many other sciences.

But although the drift in the direction of scientific method is clear, the extent to which the standards of exact science can be maintained varies greatly with the character of the facts to be handled. In the physical sciences no solution is accepted which does not square with all the known facts, and if not all the relevant facts are known, judgment must be suspended till they can be secured by observation or by experiment. In this realm, no truly scientific judgment rests on estimates. This is less true of the biological science, and still less of the social sciences. In psychology, philology, ethics, sociology, education, economics, the phenomena are so complex, the objects of study are so heterogeneous, and the mass of relevant data is so enormous that resort must often be had to samples instead of complete data, estimates frequently take the place of measurements, and evidence which falls far short of meeting the standards of the exact sciences is necessarily accepted as a basis for generalization. Consequently conclusions must be less final. This is true partly because of considerations of *time* and partly because of considerations of *cost*.[1] The student of astronomy can afford to wait for years for the reappearance of a comet or of a total eclipse to confirm or disprove his hypothesis, the physicist can spend enough money on a single experiment to make sure the conclusions are right, knowing that if the

[1] It is perhaps worth noting that time and cost are not entirely separable elements. Often they depend on one another, that is, it is possible to shorten the time of an investigation if cost can be disregarded, or to avoid the cost if one can wait long enough for the facts to become clear.

measurements are exact the experiment need not be repeated, but the educator, the military scientist, or the anthropologist cannot as a rule test his theories completely in the laboratory. He cannot even expend the funds necessary to observe the world-wide variations of the phenomenon he is studying. And yet he cannot, if his science is to have any practical application, defer judgment till the evolution of society has confirmed or disproved his views. Hence he must speak in terms of preponderance of evidence, of typical results, of tendencies, and of probable results from given lines of conduct.

The same contrast appears in the attempt to apply the scientific method to the solution of business problems which we have seen in its application to problems of thought and of knowledge. In dealing with certain types of data, highly exact measurements are possible, and the results repeat themselves with accuracy. Questions of the technique of machine industry are of this type, so long as comparisons of prices [of cost goods and output] are excluded, and even these over short periods of time are susceptible of very reliable estimation. It is in this field, therefore, that scientific management has made the most rapid strides. The value of accuracy and of scientific planning is no longer a question; the engineer has won his place. In agricultural production the incalculable element of weather makes it impossible to predict results with the same accuracy, and in marketing, finance, and labor administration uncertainties abound, some due merely to the undeveloped state of the science of business research, others impossible to avoid.

PROBLEMS

1. Why has "practical experience" so long been considered more valuable in business than "scientific knowledge"? Are the two contradictory?
2. "The greatest hindrance to business success is this theoretical stuff. We need to give more attention to practical considerations." "The most practical thing in the world is theory." With which quotation do you agree? Can they be reconciled?
3. "There can never be laws of management. The term law must be reserved for the exact sciences." Comment.
4. "It is all nonsense to talk of scientific management. Management is an art, not a science." Comment.
5. "Business management is and must remain a guessing match." Why or why not?
6. "In the field of production the body of knowledge is more exact and better organized than in the field of distribution." Is it? If so, is the condition a permanent one?

7. Are the findings of statistics conclusive or merely indicative?
8. "Measuring Aids of Business Administration." Can you formulate a statement indicating the use which may wisely be made of them?
9. "The decisions of other managers influence the outcome for any one manager." Is this true? If so, what of it?
10. "Business touches the human equation and uncertainty is therefore inevitable." Is the same true of psychology? If so, is psychology useless?
11. A certain man always "plays a hunch" because, in former years, he found he usually made a mistake when he ignored his "hunches." Comment.
12. If two alternatives presented themselves to business managers in one line of industry and 85 per cent of them decided in favor of one, would the other 15 per cent show good judgment if they decided to rely upon the judgment of the majority?
13. Do you infer from Selection 3 that thought is not a prerequisite to the forming of sound business judgments?
14. "The business manager may often form an estimate of probable results which will be almost as useful as definite knowledge provided no competitor has access to better knowledge." Explain.
15. List as many ways as you can through which a man gets "experience"; "education." Are the two different?.
16. Is there any distinction between a sound judgment and a scientific judgment?
17. "If time or cost prevents our reaching a final valid judgment, there still remain several ways of meeting the situation." What are they?
18. Look back over these questions. What have they to do with risk-bearing?
19. Could not most of these questions have been used in the chapters on marketing, personnel, finance, and production? Why bring them together in this way in a chapter on risk-bearing?

1. A COMPARISON OF PROBLEMS IN PRODUCTION AND MARKETING[1]

In the field of production, of course, the body of knowledge is on the whole better organized and more precise. The various systems of management relate more to production than to marketing.

Though a vast field for research, marketing has had comparatively little scientific study. It has not seemed particularly susceptible to

[1] Adapted by permission from S. O. Martin, "Scientific Study of Marketing," in *Annals of the American Academy of Political and Social Science*, LIX (1915), 78–80.

scientific study. It abounds in the human equation. This does not mean that much ability has not been expended on this field not only in studying and inciting demand but also in recording performance. Map and tack systems, quotas and bonuses, selling costs and carefully prepared statistics of various kinds have for a considerable period been employed by the most progressive selling organizations. These internal statistics have also been accompanied by external statistics affecting and reflecting market conditions. But in the last analysis, the figures finally used in marketing, however obtained, are based on the law of averages, frequency, or proportion; the standards set, no matter how carefully and specifically adjusted, are in the last analysis averages, modes, or proportions and apply *en masse* rather than in detail. This does not mean that these data are not regarded as exceedingly valuable. Nevertheless a great problem in marketing is to get down beneath the law of averages and types.

Production is so much more specialized and standardized, so much more precise than marketing, that it is possible, given certain facts of material, dimension, and design, to set a maximum time for the performance of a certain specific operation. The appliers of scientific management have, furthermore, shown the possibility of determining a minimum time for this operation with conditions continuing the same and of prescribing the means whereby this minimum time need not be exceeded. In other words, the scientific manager in production can not only tell William Jones how long he should be in machining a certain part, but can furnish him with the best feeds and speeds to employ in doing the work in the time specified, and if the methods and time apply in Philadelphia it is presumed that they will also apply in Boston. But in marketing, no manager, no matter how able and experienced, would attempt to tell Thomas Smith how long he should be in selling a pair of shoes to William Jones, not to give more than general instructions as to the best way in which to do the selling. About the best this manager has been able to do is to say that in a week, on the average and according to the season, Thomas Smith should sell so many dollars' worth of shoes. In machining the part, the conditions are more standardized, the operation more specialized, the human factor is smaller and is more under control. In selling the shoes, the opposite is true. In production, the time for an operation can be measured by minutes and less; in marketing, I have encountered no practical use being made of units of less than one week.

This warrants the consideration for a moment of certain fundamental differences between production and marketing. These differences may be balanced against each other as follows. In production, men meet only as members of the business—as subordinates, peers, or superiors. Neither the customer nor the competitor is encountered directly. In marketing, on the other hand, men are in contact not only with the other members of the business, but also with the customer to serve and the competitor to meet. In production, the problems are likely to be more those of cost—material, labor, and overhead. In marketing, the attention is more focused on price. Knowledge of cost is not particularly essential. The market is fixing values outside of the business' control. Emphasis is also likely to be laid on quality and service. In production, the problems on the whole are internal. In marketing, the problems on the whole are external. Competition is on every hand. The market is to be analyzed. In production, there is probably for the individual business a possibility of greater independence of action. Marketing is probably more hedged about by the customs of the trade. In other words, as said before, marketing abounds in the human equation.

2. THE SIGNIFICANCE OF THE HUMAN EQUATION IN BUSINESS PROBLEMS

The last sentence in the preceding selection touches one of the fundamental and irremovable elements of uncertainty in the business man's problem. "Business touches the human equation." That is, the decision of a business problem depends on a judgment as to what certain individuals will do under given, or partially given, circumstances. This is always fraught with uncertainty, if for no other reason because if A's decision depends on what B will do, and B's decision on what A will do, it is obviously impossible for both to get all the data they need. The only way in which one can arrive, even in theory, at a scientific solution is through a rigid exclusion of free choice from his interpretation of human conduct; but on such an interpretation the business manager himself would have no interest in the result of his analysis anyway, as his own action would be determined outside his own choice.

Moreover, quite apart from the theoretical impossibility of arriving at a scientific judgment in matters of human conduct, the

business manager runs quickly into practical difficulties similar in character to those in the social sciences, and even greater in degree. Time and cost set limits to the extent of his researches. No more than a general in the field can he wait till all the relevant facts have been gathered, nor can he afford to spend in their collection an amount greater than they will add to his profits. Even these limits he cannot definitely know. How much time, how much money it is worth while to spend in trying to complete the data on which to base a given decision, depends on facts which frequently cannot be known till the investigation is complete and the decision has been made.

In other words, the choice between two business policies or lines of action is in most cases not comparable to the solution of an algebraic equation, a type of problem where two trained minds may be expected to arrive invariably at the same conclusion. Sometimes it is rather like the translation of an inscription on a defaced monument where some of the words can be deciphered with ease, some can be made out with the aid of photography, and some can only be conjectured. Sometimes it is like a question of ethnography, where the expense of collecting data concerning an uncivilized race may make it necessary to depend on the unconfirmed accounts of a few travelers. Sometimes it is like the decision of a general in the field, where action must be taken at once, without waiting for the much desired information to arrive.

The conclusion is not, however, that since we cannot know all we would like to know we cannot conduct ourselves rationally. If time or cost prevents our reaching a valid final judgment, there still remain several ways of meeting the situation.

In the first place the business manager may often form an estimate of the *most probable* results which will be almost as useful as definite knowledge provided no competitor has access to better information than he has. Such estimates of probability fall roughly into three classes.[1] There are, first, a few cases where a quite definite mathematical estimate of probability can be reached, as for instance that a result will be of one character seven times out of a hundred, of another character ninety-three times. Many gambling transactions are of this sort, but they are rare in ordinary business. The Goodyear Company in 1921 issued a series of 8 per cent bonds, one-fortieth of which, drawn by lot, are to be paid at $120 per $100 bond every six months for twenty years. It is clear that the probability of an

[1] Cf. Knight, *Risk, Uncertainty, and Profit*, pp. 214–16, 224–26.

investor's securing a 20 per cent bonus for the use of his money for six months, twelve months, or any other definite period can be figured mathematically and the speculative value of this chance computed with corresponding precision.

A second and larger class of cases afford what may be called a statistical basis for judgment. These are cases where no uniformity of results could be predicted from the nature of the case, but study of past results shows that uniformities have appeared with such persistency that we assume they will continue to appear. This is the justification of most business research, as distinguished from technological research. The merits of specific selling devices, specific methods of wage payment or organization of the labor force, or specific types of financial instruments cannot be judged even approximately by a single case; but by collecting, organizing, and studying a mass of representative cases results of great accuracy can be obtained.

Cases of uncertainty where neither the mathematical nor the statistical basis of determining probability is available call for the exercise of what we call "judgment." By judgment we here mean the ability to weigh the known elements in a situation and determine the most probable situation with respect to the unknown. Just what this ability consists of and how it can be cultivated is a question of great practical interest, but one about which, unfortunately, very little is known.

3. THE FORMATION OF "JUDGMENTS"[1]

The mental operations by which ordinary practical decisions are made are very obscure, and it is a matter for surprise that neither logicians nor psychologists have shown much interest in them. Perhaps (the writer is inclined to this view) it is because there is really very little to say about the subject. Prophecy seems to be a good deal like memory itself, on which it is based. When we wish to think of some man's name, or recall a quotation which has slipped our memory, we go to work to do it, and the desired idea comes to mind, often when we are thinking about something else, or else it does not come, but in either case there is very little that we can tell about the operation, very little "technique." So when we try to decide what to expect in a certain situation, and how to behave ourselves accordingly, we are likely to do a lot of irrelevant mental rambling

[1] Adapted by permission from F. H. Knight, *Risk, Uncertainty, and Profit*, pp. 211, 225–27. (Houghton Mifflin Company, 1921.)

and the first thing we know we find that we have made up our minds, that our course of action is settled. There seems very little meaning in what has gone on in our minds, and certainly little kinship with the formal processes of logic which the scientist uses in an investigation. We contrast the two processes by recognizing that the former is not reasoned knowledge, but "judgment," "common-sense," or "intuition." There is doubtless some analysis of a crude type involved, but in the main it seems that we "infer" largely from our experience of the past as a whole, somewhat in the same way that we deal with intrinsically simple (unanalyzable) problems like estimating distances, weights, or other physical magnitudes when measuring instruments are not at hand.

We know that estimates or judgments are "liable" to err. Sometimes a rough determination of the magnitude of this "liability" is possible, but more generally it is not. In general, any determination of the value of an estimate must be secured by the tabulation of instances of accuracy and inaccuracy of similar estimates, thus reducing it to a probability of the statistical type.

The theoretical difference between the probability connected with a mere estimate and that involved in statistical calculations such as those used in life insurance, is clearly discernible. Take as an illustration any typical business decision. A manufacturer is considering the advisability of making a large commitment in increasing the capacity of his works. He "figures" more or less on the proposition, taking account as well as possible of the various factors more or less susceptible of measurement, but the final result is an "estimate" of the probable outcome of any proposed course of action. What is the "probability" of error (strictly, of any assigned degree of error) in the judgment? It is manifestly meaningless to speak of either calculating such a probability *a priori* or of determining it empirically by studying a large number of instances.

Yet it is true, and the fact can hardly be over-emphasized, that a judgment of probability is actually made in such cases. The business man himself not merely forms the best estimate he can of the outcome of his actions, but he is likely also to estimate the probability that his estimate is correct. The degree of "certainty" or of confidence felt in the conclusion after it is reached cannot be ignored, for it is of the greatest practical significance. The action which follows upon an opinion depends as much upon the amount of confidence in that opinion as it does upon the favorableness of the opinion itself.

The ultimate logic, or psychology, of these deliberations is obscure. We must simply fall back upon a "capacity" in the intelligent animal to form a more or less correct judgment about things, an intuitive sense of values. We are so built that what seems to us reasonable is likely to be confirmed by experience, or we could not live in the world at all.

[The following might be added to Professor Knight's analysis. It seems fairly clear that our judgments, if they have any value at all, are based invariably on some sort of experience with similar cases, either our own experience or that of others. The cases from which we judge may be too few to lend themselves to statistical tabulation, or too widely different for comparison, but if we use them at all it must be through a crude, perhaps unconscious, application of what is essentially the same process as is employed in the statistical method. The difference between good judgment and bad judgment resolves itself into (1) a difference in the amount of data made available by personal experience or by education, (2) the ability to classify that experience so that only the relevant items enter into the judgment, and (3) the ability to give proper relative weight to the items which make it up.

Of these the last is the most difficult. The tendency is to overvalue one's own experience in contrast to that of others, to overvalue the evidence which points to a conclusion coincident with our own desires or interests, and to overvalue the recent experience contrasted with that which is less fresh in our minds. To overcome these tendencies is to gain immensely in skill at forming judgments. And no one should feel chagrin if, having taken into consideration all the available data and applied his most careful judgment, the event proves him to have been wrong. No excellence of judgment can eliminate the sphere of uncertainty, it can only tell us what is most probable. If the improbable happens, the judgment of the reckless plunger who foretold it is not thereby vindicated nor that of the careful student discredited. Only average results over a period of time can furnish a test of skill.

Herodotus states the point aptly thus:

> There is nothing more profitable for a man than to take good counsel with himself; for even if the event turns out contrary to one's hope, still one's decision was right, even though fortune has made it of no effect: whereas if a man acts contrary to good counsel, although by luck he gets what he had no right to expect, his decision was not any the less foolish.[1]

[1] Quoted in Keynes, *A Treatise on Probability*, p. 307.

What has been said in Section A may be summarized as follows: The exact scientific method has proved extremely profitable when applied to certain problems of business, notably those of machine technology. The method of the less exact sciences, namely, the collection of sample cases and their interpretation by statistical methods, has also proved very profitable when applied to certain types of problems, notably market research and personnel administration. Questions frequently arise, however, where neither of these methods is applicable and reliance must be placed in "judgment." This situation arises most frequently (*a*) when the problem is of such unique character that adequate statistical data cannot be compiled (such problems are likely to be of major importance); (*b*) when time does not permit the collection of data for scientific decision; and (*c*) when the case does not justify the expenditure necessary to form a scientific decision. In such cases we can do nothing but reason from such data as we have, and recognize the possibility that our results may be wrong.]

See also p. 768. An Analysis of Business Judgment.

B. Some of the Leading Forms of Business Risk

The preceding section gave us a view of the position of the risk-taker in our society and some appreciation of the character of business problems, from the point of view of risk-bearing. We shall now survey the main forms and causes of business risk and in Section C (pp. 664–95) we shall take up again the study of the various courses of action open to the manager.

It quickly becomes apparent that there are some risks which would be present in any organization of society. There are others which owe their presence, or at least their virulence, to our particular organization of society. Illustrations of the sources of both these classes of risk are given in the following readings.

PROBLEMS

1. "The grower, the manufacturer, and the merchant *must* speculate." Why?
2. Are risks greater in a changing condition of industry? In a market of greater time area?
3. Commercial speculation may concern itself either with the time area or the space area of the market. Explain.

4. How does the "roundaboutness" of modern industry affect risks?
5. What is chance? As far as this one factor is concerned, is society becoming more speculative?
6. "The interdependence of a specialized society means risk." Precisely why?
7. Explain how the presence of highly specialized capital goods in modern industry accentuates risk.
8. "The antagonism of specialists increases risk." Precisely why?
9. Does increasing complexity of our economic organization increase risk?
10. Does the presence of indirect cost in industry mean more risk?
11. If competition were to become more strenuous, would risks increase? Do competing companies ever get a reduction of risk through their very competition?
12. Does expanding education have any tendency to increase risk?
13. How has the development of improved transportation and communication affected risk?
14. "The pecuniary organization of society not only transmits shock but also increases shock during transmission." Is this true? Is it always true?
15. It has been said that we have a society that is very sensitive to demand and to shock. Explain. What is the result, as far as risks are concerned?
16. When one says that the development of a certain way of doing things (e.g., want gratification through specialization) increases risk, is one condemning that way? Does risk mean cost?
17. Would any of the risks in our society be eliminated by the adoption of socialism? Would any risks be increased or added?
18. "Risk and ignorance are synonymous terms." What has the writer in mind in saying this?
19. "Remember that risk means uncertainty. Once we *know* what loss is to occur, risk ceases although cost continues." Explain.
20. Did the medieval craftsman have risks? If so, what risks? Are they the same as those carried by modern industry?
21. "If risk bearing is well performed, so much the better for society. If it is poorly performed, so much the worse for society." Specify.
22. Do you gather that risks are increasing? Is there any answer to this question? Suppose they are increasing; is society worse off?

4. SOME LEADING FORMS OF RISK[1]

All risks may be divided into static risks and dynamic risks. Static risks are those risks which would be found in a stationary state of society. Among them are those due to natural causes, such as

[1] Adapted by permission from John Haynes, "Risk as an Economic Factor," *Quarterly Journal of Economics*, IX (1894–95), 412–14.

damage by lightning, hail, earthquake, storms, disease, and many others. Risks arising from ignorance are a large class, which includes many fires, bankruptcies, sicknesses, accidents, early deaths, and failures in business from misdirected effort. Carelessness is closely akin to ignorance as a cause of damage. Lack of moral character gives rise to a class of risks known by insurance men as moral hazards. The most familiar example of this class of risks is the danger of incendiary fires. Dishonest failures, bad debts, etc., would fall in this class, as well as all forms of danger from the criminal classes. When these risks are spoken of as static, it is not meant that dynamic changes cannot modify them. Such is not the case. The invention of the electric light was a dynamic change which has modified the danger of damage by fire. Nevertheless, we may legitimately use the word "static" because, even in a stationary state of society, we should expect risks of the same essential kind. The amount of loss coming from static risks is incapable of calculation, but is certainly very great. The losses direct and indirect by fire alone are estimated by Mr. Edward Atkinson at $250,000,000 for the United States in 1893.

Other risks may be called dynamic, because they are risks of damage which may be directly due to dynamic changes. These are chiefly of two kinds, the first being changes in the wants of society. As civilization advances, human desires are subject to constant modification and to sudden changes in amount and direction. Changes of style which cannot be foreseen by producers are an example of changes in the wants of society. A stock of men's hats which is salable today will, perhaps, be utterly without a market next year. A dealer who has an overstock is subject to heavy loss.

In the second place, changes in methods of production give rise to losses which may be subdivided into two classes. The first are the losses which fall upon those who are attempting to introduce new processes. Professor Clark says:

> The uncertainties that attend the introduction of a new process are dynamic, since they would have no existence if industry were to continue in a stationary state. There is the chance that the process may be mechanically defective. It may not create the desired commodity as the projector of the enterprise expects. If, on the other hand, the dynamic change consists in offering some new commodity for the comfort and pleasure of consumers, the public may fail to give the expected welcome.

The second are losses which fall upon producers in consequence of the introduction of improved processes by others. There is constant

danger that an innovation or an improvement of some kind will destroy the value of property in which a great amount of capital has been invested. Losses of this kind differ from those of which Professor Clark speaks, in that while causing a loss to individuals, they being a social gain. The wealth directed to the unsuccessful venture might have been employed in lines of static activity; but, by being diverted, it is lost, not only to its owner, but to society as well. In the second case, though society is a gainer by the improvement, individuals are large losers. Losses of this kind have been exceedingly common in recent years. A notable case was the destruction of capital incident to the opening of the Suez Canal. The ships, mainly sailing vessels, which went around the Cape of Good Hope and carried the products of India, were not adapted to the canal, and an amount of shipping estimated at two million tons was rendered practically valueless. It is clear that the total amount of dynamic losses must be very great.

5. THE SEPARATION OF PRODUCER AND CONSUMER MEANS RISK[1]

[Even before the days of specialization, when producer and consumer were one and the same, there was some "business" risks. A primitive cultivator of the soil who planted grain took a risk. The season might be bad; fowls or animals or a storm might destroy the crop. With the coming in of specialization and "production for the market," the possibilities of risk were greatly increased. The following selection deals with this situation, using the term "speculation" to express the idea of the assumption of risks.]

A large speculative element is involved in trade of every kind. The trader seeks to buy articles at as low a price as he can and to sell them at a higher price. He may do this either by buying them in a market where they are cheap and selling them in a market where they are dearer; or by buying them at a time when they are cheap and selling them at a time when they are dearer. The difference between his buying and selling prices represent his profit on the transaction. The uncertainty attaching to the amount of such profit makes the operation a speculative one. There is a serious risk of loss, which the trader assumes for the sake of a possible gain.

[1] Adapted by permission from A. T. Hadley, *Economics*, pp. 100–115. (G. P. Putnam's Sons, 1899.)

Down to the present century, a large part of the speculative profits were made by taking advantage of differences of price in different places—chiefly in connection with foreign trade. The means of communication and transport were so defective that there was often a great scarcity of an article in one region and an abundance of the same article in another. The shipowners who moved the article from the latter place to the former had a chance of enormous profits. But the business was also attended by great risk. Transportation was far less safe, either from the elements or from human violence, than it is today. There was no telegraph, no good postal service, no efficient protection from pirates by sea or highway robbers by land. All these causes combined to render the arrival of goods so uncertain that the very wages of the seamen were made contingent upon the safe delivery of the cargo, and the whole body of sailors thus became participants in the speculation.

The nineteenth century has witnessed a change in these respects. Improved means of communication have greatly lessened the differences in price in different markets. It is no longer possible to have a glut of wheat in Chicago and a scarcity in Liverpool. The modern post-office and the telegraph furnish prompt information of what is going on all over the world and enable merchants to know where goods are most needed. The steamship and the railroad furnish a quick and safe means of placing the goods where they will meet such needs as may arise. The difference of price of any staple article in two large wholesale markets will not generally be much greater than the cost of transportation from one to the other. So moderate have the profits from this source become that the business of those who try to secure them is now known as *arbitrage* rather than speculation. Only in the trade with barbarous or half-civilized races does foreign commerce retain its character as an extra-hazardous business.

The speculator of today makes his money chiefly by taking advantage of differences of price between different *times* rather than between different markets. It is not so much the difference in the price of wheat in Chicago and in Liverpool which furnishes the source of his profits, as the difference between its price in Chicago this month and next month. When such speculation anticipates an actual demand, it is of great service to the community. The long time which elapses between production and consumption, between contracts and their fulfilment, makes it extremely important to have responsible men to anticipate the wants of the market and take the risks on their own shoulders.

It is not only in commercial matters but also in industrial ones that the speculator exercises a dominant influence. He controls production as well as trade. What the merchant does when he buys products in the hope of selling them at an advanced price, the manufacturer is doing when he buys labor in the hope of selling the results of that labor at a profit. The whole wage system is one under which the employers of the country part with property rights today in the hope of securing larger property rights in the future. Part of their prosperity arises from skill in organizing labor; part, and usually a larger part, arises from skill in foreseeing the wants of the market. The success or failure of a man engaged in manufacturing, in transportation, or in agriculture depends more upon his skill as a prophet than upon his industry as a producer. The industrial development of the last three or four hundred years, rightly interpreted, is an account of the reasons which have led society to put the control of its industry into the hands of a body of speculative investors.

All productive industry involves a certain amount of risk. Whenever time elapses between the application of labor and the completion of the product of labor in a form available for actual enjoyment, there is an advance of capital to the producers for the sake of a remote and generally somewhat unknown result. In the building of a factory or a railroad a great deal of food is consumed. Whether the product of the labor thus applied will be as useful to the community as the food which was consumed by those who have produced it, is always somewhat uncertain. The more remote the consumers in time or place, the greater is the uncertainty and the more speculative the whole transaction. Especially prominent does this uncertainty become in the application of any new process or the development of any new locality. Under old conditions, experience has proved what products are wanted and how labor can be economially applied; but every new invention or new settlement involves a multitude of new and unknown conditions.

6. CHANCE MEANS UNCERTAINTY AND THEREFORE RISK[1]

"Chance" means uncertainty; not uncertainty in the frame of things, but uncertainty in the beholding mind. That is all. "Chance" is a negative term. It announces the absence of knowledge

[1] Adapted by permission from G. H. Palmer, *The Problem of Freedom*, pp. 131–39. (Houghton Mifflin Company, 1911.)

and is a way of stating ignorance. When we cannot trace the causative connections which have brought an event about, we say it was due to chance. Such a word furnishes a convenient label for marking occurrences as still dark.

A few instances will set forth this frequent meaning of chance. I shake my dice-box, and say it is all chance how the dice will fall. Nobody understands that in the brief space between box and table causal agency is suspended, nothing obliging one of the dice to turn up the number six. I certainly never intended such a notion, rather this: it is impossible so precisely to reckon the forces which steer that bit of ivory that we can forecast the number which will finally appear. Such minuteness of knowledge implies a delicacy in observing the complex play of forces about those little objects which nobody today possesses; and though I can make a fairly accurate guess as to the frequency with which the number six will turn up, this will not at all hinder my attributing the result to chance; for I still wish to mark the fact that I know nothing of the way in which laws of gravitation have been attacking the different sides of the cube.

Is this the only meaning of chance, or is chance also objective? I believe it is objective. This world is not altogether an orderly affair. I hold that, apart from our defective knowledge, there are uncertainties in the nature of things. Suppose I am throwing stones at a mark. Each stone I hurl as vigorously as possible and all in the same direction. As I throw the last one a bird flies across; and the stone, instead of moving unimpeded to its mark, collides with him. He is killed. What killed him? Chance; his death was due to accident. Of course this does not mean that there was no causal sequence attending the death and that his existence ceased of itself. Everybody knows it was the stone's blow that killed him and that it would kill any similar bird in similar circumstances. Sequential causes were at work and without them the bird would not have died. Where then is the chance? It is found in the concurrence of the flight of the bird and the flight of the stone.

For such coincidences we do well, I believe, to say there is no proper cause, that they are affairs of chance, luck, or accident; for these terms by no means exclude sequential causation moving in straight lines. They merely note the absence of those antesequential terms by which combinations are effected. Chance might be defined as planless concurrence; and when it is so defined, we discover it all around us, in great things and in small. It was an accident that the

winter was exceptionally severe after the landing on our shore of the Pilgrim Fathers; that the tower of Siloam fell on those particular persons; that the partridge flew past me when I did not have my gun. The liberties of England are largely due to chance in the storm which arose soon after the sailing of the Spanish Armada. For however minutely we might become acquainted with the sequence of conditions which led up to the storm, or to that other sequence which led up to the sailing, we should never discover the wreck among them. That was an accident, the coming together of two independent lines of causation which until that coinciding moment had no reference to one another.

7. THE INTERDEPENDENCE OF A SPECIALIZED SOCIETY INCREASES RISK[1]

We have seen repeatedly that our modern method of producing goods is one involving specialization, co-operation, and interdependence. This interdependence exposes our risk takers to some very serious problems. What happened to a certain cotton planter well illustrates this matter.

This Mississippi cotton planter had for years raised cotton at the cost of about nine cents per pound which he sold to a "local buyer" in a near-by town. The local buyer in turn sold it to a New Orleans agent of a New York firm, and finally it reached the cloth manufacturers of England, France, or New England. In 1914 while this planter was going about his tasks in the usual way events far from him were shaping themselves in such a way as to make much that he had spent for tools, labor, and seed profitless. Late in July of 1914 the great World War began in Europe. In consequence, English, French, and German merchants refused to buy new supplies of cotton cloth. They did not know how the war might affect their customers. Some would be at the front, others out of work, and all would be economical in their purchases. As a result, cloth manufacturers in Europe did not order cotton from the exporters in the United States. Naturally, the exporters would not buy a great deal of cotton from the local buyers in the cotton districts. Almost as soon as the cotton planter heard of the war he learned that the local cotton buyers were offering a lower price for cotton. During the following weeks the price fell lower. At times, buyers refused to state any price. Finally,

[1] Adapted by permission from L. C. Marshall and L. S. Lyon, *Our Economic Organization*, pp. 376–79. (The Macmillan Company, 1921.)

however, near the first of December this planter was able to sell his cotton at a price of six cents a pound. Instead of making the profit that he had anticipated, he sustained a loss of three cents for every pound of cotton he raised.

No one in particular was to blame for the losses of this planter. They grew out of the fact that he was producing for an "unknown" market. His success or failure depended upon factors over which he had no control. These factors affected many other besides this planter. When the price of cotton fell, the storekeepers in the cotton belt knew that the planters would be unable to buy the usual amounts of clothing, shoes, and other necessities and luxuries. As a result they refused to purchase goods from manufacturers. One Chicago shoe salesman who usually spent two months taking orders from Southern storekeepers covered the territory in two weeks. Many merchants in the South failed in business, and as they could not pay their bills, their creditors—banks from which they had borrowed and merchants from whom they had bought goods—were in some cases forced into bankruptcy. Factories in turn from whom merchants purchased found business dull and in some instances closed their doors. Thus there spread over the South, and extended to many businesses in the North, a condition that is called a *business depression.* Manufacturers, banks, farmers, and merchants were all affected. Yet they were in no way to blame. The cause lay in the fact that they were specialists and were dependent on other specialists. All being interdependent, the disturbance had spread rapidly to all of them and brought with it ruin and loss.

Sometimes such business depressions are much more severe and affect the entire country. Thousands of factories close their doors, allowing the machinery which they contain to lie idle. Railroads, having few goods to carry, are not used to anything like their full capacity. All of this, of course, represents a great waste. The factory buildings and machines—which are capital—produce nothing and deteriorate while idle. The railroads wear out almost as fast when not in use as when traffic is being carried, and thus there is a waste of capital when they are not used to the limit. These depressions sometimes last for months and even years before the readjustments come which again call for the use of all the capital which society has built.

The risks arising from the foregoing causes are the more difficult to meet because of the technological character of modern industry.

In these days, money is invested in fixed or specialized capital such as machinery, railroads, and buildings. This means that productive energy has taken a form which cannot be changed without waste and loss. A knitting machine, for example, can be used for but the one purpose. If not used for that, it must stand idle. If the idleness continues for a long time, it will certainly deteriorate and perhaps ultimately it must be scrapped. This means a loss to the owner and a waste to society in that there are unused resources. If these capital goods could be shifted readily to another use, the loss would not be so great, but this is not possible with highly specialized productive instruments. The cloth manufacturers of England and France in the case just mentioned realized this to the full. In building their factories, they had made capital investments. When no orders for cloth came, their machines and buildings were idle. Also, the cotton exporting companies in New Orleans and other cities had built up the trade connections of their business. They had established offices in this and other countries; they had installed furniture, telephones, and workers. They found that their great organizations had now little work to do. Heavy losses to the owners were the result. Nor was society gaining from this idle capital and organization.

8. ANTAGONISM OF SPECIALISTS INCREASES RISK[1]

[Anyone can see that the risk of strikes or lockouts, the risk of a "consumer strike" against high prices asked by producers, and all such similar conflicts between the specialists of modern society are business risks. The following selection is interesting in that it indicates that a potent cause of such risks is mutual ignorance and suspicion on the part of the specialists of our modern impersonal society.]

Wherever a collection of human beings begins to resolve itself into a society, the process involves a tacit agreement that some of the persons will attend to a certain work needed by the society, while others will look after the remainder. The smith, the carpenter, the miller, the tanner, the cobbler, are enabled to live without procuring their own food supply directly from the soil, by becoming agents of the farmers in doing needed work of which the farmers are thus relieved. On the other hand, the farmers fall into line with the

[1] Adapted by permission from A. W. Small, "Private Business a Public Trust," *American Journal of Sociology*, I (1895–96), 283–89.

necessity of industriously extracting from the soil a supply of food sufficient for the whole community, as the condition of getting the use of other men's skill.

The fundamental grievance of classes against other classes in modern society is that the supposed offenders are violators of this primal law of reciprocity. Criticisms of institutions or of the persons operating them resolve themselves into charges that whereas the parties in question are presumed to be useful social agencies, they are in reality using their social office for the subordination of public weal to private gain. This is at bottom the charge of the dissatisfied proletarian of all classes against employers, capitalists, corporations, trusts, monopolies, legislators, and administrators. This is also in large part the implied countercharge against organized labor. The most serious count in the wage-earners indictment of other classes is not primarily that these classes draw too much pay, but that they are not doing the work that their revenues are supposed to represent. The unrest of our society today is due, in large measure, to suspicion that men are falling more and more into the position of toilers for other men who are evading the law of reciprocal service. Dissatisfaction is fed by belief that many occupations, needful in themselves, are becoming less and less a social benefaction and more and more a means of levying tribute over and above the value of the service.

See also p. 164. The Fears of Labor and of Capital.

C. Ways of Dealing with Risk

It is clear enough that there is no escape, present or future, from the presence of uncertainty in the administration of business, and that we must accordingly deal with risk, which may be defined as uncertain loss or damage. The elimination of the risk requires the elimination, not of the loss or damage itself, but of the uncertainty concerning its time or place or extent. Usually this involves the substitution for the uncertain loss of a smaller but certain loss in one form or another. This cost, for instance, may consist of the price of a safety device, which may never be needed, but if it is needed, will save many times its cost—it may be an insurance premium, or it may be the cost of an investigation to remove the uncertainty. Obviously, it does not pay to get rid of all the risk it is possible to get rid of. We could practically eliminate fire losses in cities by building every structure

of fireproof material, equipping it with automatic sprinklers and stationing a fire company in every block, but the cost would far outweigh the saving. The problem of administration of risk is chiefly the problem of balancing one of these against the other, a loss which may or may not occur against the cost involved in getting rid of the risk.

This present section outlines the various methods of dealing with risks. It opens with Selection 9 which reminds us that, as our society is organized, it falls to the lot of the entrepreneur to assume business risks and continues the discussion begun in Selection 3 on the formation of business judgments with particular reference to what may be called administrative qualities. Selections 9–16 indicate the methods open to the manager in coping with risks on the basis of the following outline:

1. Elimination by
   a) Prevention of the harmful events
   b) Forecasting, or research to remove the uncertainty
   c) Combination of risks
2. Transfer to others (which may or may not involve elimination of the risk), illustrated by
   a) Insurance
   b) Guaranty, suretyship, underwriting, etc.
   c) Contracting out
   d) Hedging

The section concludes with a brief discussion (Selection 17) of the place of the risk-bearing functionary in a modern business organization.

PROBLEMS

1. Illustrate risk being reduced (1) by increasing our knowledge of the future; (2) by employing safeguards; (3) by insurance; (4) by speculative contracts; (5) by social control.
2. Is it possible by foresight and calculation to reduce or to avoid some of the risks of industry? All of the risks of industry?
3. Does integration reduce risk?
4. Is the collection of statistics by trade journals a co-operative or a specialized method of reducing risk?
5. Why should not the government undertake research in manufacture on the same scale as in agriculture?
6. "A strong tendency shows itself for risky enterprises to be carried on by large scale methods." Why? Cite illustrations. Can you cite illustrations of the opposite character?

7. Should a large insurance company be able to give better rates than a small one?
8. How does incorporation aid in lessening risk? Does the feature of limited liability reduce risk or merely transfer it?
9. Does insurance reduce risks or does it transfer risks from the individual to society?
10. Should a state carry insurance on its buildings?
11. B, a dealer, has 500 automobiles in stock. Should he insure them?
12. In ordinary life insurance, what is the risk insured against? At what time of life is the risk greatest? least?
13. Should the amount of the insurance carried on buildings depend on their cost or on present cost of replacing them?
14. C is supported by the income from his wife's property and does not work. Should his life be insured? Should his wife's life be insured in his favor?
15. A certain cotton manufacturer displays great ability in the production of cloth, but he is nevertheless barely able to keep his head above water, because he is a poor judge of the raw-cotton market and is more likely than not to buy when prices are inflated. Show how he could liberate himself from the consequences of this defect of judgment.
16. Speculators are often regarded as mere gamblers. If the whole body of speculators were to cease buying and selling grain, and limited themselves to betting upon the course of prices, would the work of commerce and industry be carried on exactly as it is at present?
17. What is the distinction between trade profit and speculative profit in hedging operations?
18. "Speculative contracts do not reduce risks; they simply pass the risks along, and society must face as many and as great risks as would have been the case if no such device as speculative contracts had arisen." Is this true?
19. "The speculative trader of the board of trade is another specialist." Is this true? If so, in what does he specialize?
20. "The board of trade is one of the greatest insurance institutions in existence." Do you agree?
21. Under government control of the wheat market there was no trade in future contracts. Does this show that they are unnecessary?
22. Is speculation a result or a cause of risk?
23. Companies writing fidelity insurance inquire whether their candidate speculates. Why?
24. Sometimes bonds are callable at a certain price until a certain date, say five years before maturity, and after that at a lower price. Is this a logical arrangement?
25. How, if at all, does budgeting affect risks? Cost accounting?

26. Do consumers bear any risks? Do they bear all risks? If they do, what is meant by speaking of the entrepreneur as the risk-taker of industry?
27. If A indorses B's note, and the holder estimates the risk of A's failure at 1 per cent and B's failure at 2 per cent, what is the probability of both failing? Does it make any difference whether they are in business relations with one another or are in similar occupations?
28. "Given other qualities the same, a pessimist will outdistance an optimist because, not having so great faith in luck, he will work harder and will look facts more squarely in the face." Do you agree?
29. Give some examples of when "it is cheaper to run risks than to avoid them."
30. "An expert business manager is a great aid in lessening risk." Does he reduce risk or transfer it?
31. Does the elimination of risk mean the elimination of loss?

9. ENTREPRENEURSHIP AND ADMINISTRATIVE QUALITIES

Wherever modern capitalistic methods have gone, the production and distribution of goods require that expenses be incurred and responsibilities undertaken long before the goods are to be consumed. This means that risks must be incurred—technical risks, market risks, and risks of social and political change. As we are organized, these risks fall chiefly on the producer and distributor. Conceivably they might be carried by the consumer, as they are to a limited extent, especially when goods are made to order. But typically (and increasingly) the producing or distributing organization assumes these risks and, as has often been pointed out by theoretical economists, the possibility of making profit (as distinguished from the market rate of interest and wages) arises chiefly from this fact. This means that certain mental attitudes and characteristics are necessary for administration and operate more or less crudely to select the individuals on whom the responsibilities of business shall fall.

Without attempting an exhaustive survey, attention may be directed to four of the qualifications which seem to be most directly significant in the selection of business managers. The first is business judgment, the second is willingness to incur the risk of making a mistake, the third is open-mindedness, the fourth is decision.

All these qualities have to do with one's attitude toward uncertainty. *Business judgment* has already been discussed (see pp. 644–54). *Willingness to incur risk* involves several characteristics. A

large element in it is confidence in one's own judgment. This is something quite distinct from the ability to form a correct judgment. To quote Professor Knight again:

> In addition there is diversity in conduct in situations involving uncertainty due to differences in the amount of *confidence* which individuals feel in their judgments when formed in their powers of execution; this degree of confidence is in large measure independent of the "true value" of the judgments and powers themselves. . . . . It is a familiar fact that some individuals want to be sure and will hardly "take chances" at all, while others like to work on original hypotheses and seem to prefer rather than shun uncertainty. It is common to see people act on assumptions in ways which their own opinions of the value of the assumption does not warrant; there is a disposition to "trust in one's luck."[1]

Next to business judgment this quality of confidence in and willingness to act on one's best judgment where certainty is absent seems to be the most decisive factor in determining whether one shall be among those who occupy positions of responsibility—indeed, so far as the *choice* of managers is concerned this factor of willingness to accept responsibility is perhaps more important than the ability to form correct judgments, though less important in determining the manager's success. The other two qualifications for dealing effectively with risk, decision and open-mindedness, may seem at first to be inconsistent with one another, but they are not. By *open-mindedness* we mean the ability and willingness to change our decision or opinion as soon as the appearance of new evidence makes it appear that our former position was wrong; by *decision* the ability and will to stick to a judgment once formed until such reason for change has actually appeared. Efficiency in business management, as in most responsible tasks, requires that one steer a middle course between two extremes. On the one hand, we have the vacillator, the wobbly-minded man who, having chosen one line of policy on a doubtful issue, cannot forget the alternative and is constantly reopening the issue and debating the question over without any new evidence on which to decide. At the other extreme we have the "bullhead," the man who, having chosen an alternative, sticks to it with obstinacy, refusing to be influenced by new evidence which may make the grounds of his original choice no longer valid. There are none so blind as those who will not see.

See also p. 794. Administration as Leadership.

[1] F. H. Knight, *op. cit.*, p. 242.

10. THE PREVENTION OF HARMFUL EVENTS AND THE USE OF RESEARCH

No very detailed discussion of the preventive method of eliminating risk is necessary. Umbrellas, lightning-rods, fireproof walls, and burglar alarms furnish illustrations. One prevalent phase of the preventive method of dealing with risk should be noted, however, namely, the practice of maintaining reserves for contingencies. Thus the manager of a bank in addition to the funds he expects to need from day to day, carries in his vaults a sum of idle money which he probably will not need, but which some time he may need very badly. The grocer carries a little bigger stock than he will probably need before he can secure another shipment. Financial managers refuse to pay out in dividends the entire earnings of their firms, or even the full amount which can apparently be spared. Manufacturers carry extra stocks of raw materials and of repair parts. Such reserves are not entirely due to the risk. They may be accounted for by economies in manufacture or transportation of large units. But in large part they are necessitated by the presence of risk.

So long as uncertainty exists, the loss of production due to the idleness of the labor reserve or the capital reserve cannot properly be called a waste. Its maintenance is a cost—the cost of uncertainty. Whether it is a social waste depends on the question whether the uncertainty can be removed at a cost less than the loss of production from the maintenance of the reserve. In large part, the uncertainty is of course quite beyond our powers to remove. So long as this is true, the cost of maintaining reserves is no more a "waste" than is the wear and tear on machinery or the cost of raw materials used up.

Neither is it necessary, in view of the emphasis on scientific method in other parts of this work, to discuss at length the field of research. Whenever the bounds of knowledge are extended the field of risk is narrowed. The importance of commercial research as a basis for the management of the market, of psychological and social investigation as a guide in the administration of personnel problems, time study, laboratory analysis, and other technical methods of attack, all these are familiar ideas, however far we may fall short of realizing their possibilities in practice.

There are very definite limits, however, to the extent to which individual businesses will ever find it to their advantage to eliminate risk either through research or through protective devices. The determining consideration is one of cost, and there are many fields in which it

remains true that it is cheaper to run risks than to avoid them. Cost of elimination of risk is often in the nature of a fixed charge. The larger the volume of business, the more likely is this fixed charge to be a good investment; hence a strong tendency shows itself, other things being equal, for risky enterprises to be carried by large-scale methods. The same advantage may be gained by either of two other methods—co-operation and specialization. In the co-operative method the cost of research or protection is divided directly among a large number of business units, while by the method of specialization it is shifted to business units which specialize in carrying or eliminating the risk and are paid for so doing.

Co-operative action to reduce risk is well illustrated by many of the activities of government. Weather-forecasting has reduced immensely the risks of loss and damage to property on account of frost and flood. No single business could afford to maintain a weather-forecasting service of the scope of that provided by the government, yet when the cost of this service is spread over all the lines of business which profit by it, it makes only a trifling addition to the burden of taxation. Research undertaken by the Department of Agriculture, the Department of Commerce, consular bureaus, and the Geological Survey have resulted in large additions to our store of exact knowledge in fields where a few years ago production was prevented or made hazardous by a lack of sufficient facts on which to base a valid judgment. In like manner government may be shown to be our most important co-operative device for eliminating risk through *prevention* of harmful events. The maintenance of fire departments and of lighthouses and many other phases of government activity are merely co-operative methods of eliminating the risks of production through activities which would be far too costly for single businesses, but which are very economical when their cost is divided among all who benefit from them. Other co-operative devices besides government may be used in the same way. Chambers of commerce maintain bureaus of exchange of credit information to lessen the risk of bad debts. In small communities they often contribute to the support of night watchmen to supplement the protection afforded by the city police. Trade associations reduce risk by the maintenance of research organizations. This is but a beginning of a very long list.

The other characteristic modern method of spreading the cost of research over a large number of business units is the development of specialists who furnish the service for pay. This method is illustrated

by such diverse enterprises as clipping bureaus, the Business Bourse, advertising agencies, investors' service bureaus. A very recent development of this sort is the specialized labor service bureau whose chief business is the collection of data for trade-union use in labor disputes.

See also p. 415. Some Financial Information Gatherers.
pp. 192–226. Measuring Aids of Personnel Administration.
p. 314. Analysis of Product, Market, and Channels of Distribution.
p. 319. Some Phases of Market Analysis.
p. 337. Measuring Aids, Quotes, and Budgetary Control.

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11. ELIMINATION BY COMBINATION OF RISKS

A

By combination of risks is meant a grouping of similar items in such a way that we can tell more about the group than we can about the items which compose it. Elimination of risk by combination is the application of the so-called law of large numbers. It is often the case that we have a high degree of certainty about a group of data while at the same time we are in complete ignorance about the particular items which make up the group. Thus we may be quite sure that we can predict within 30 per cent the amount of rainfall which will occur in a given region in the next year, while if we try to predict the precipitation for any particular week, it is more likely than not that the actual result will be either less than 10 per cent or more than 1,000 per cent of our estimate. So with death rates, marriages, enrollments in colleges, desertions from the army, accidents due to fireworks, and thousands of other contingencies. A single event defies prediction, but the mass remains always practically the same or varies in ways which we can predict. It is obvious that any device by which we can base our business decisions on the average which we can predict, instead of on the single event, means the elimination of unnecessary risk. The larger the number of cases observed the less is the deviation of observed results from those which *a priori* were most probable.

It follows that large-scale production has an advantage over small-scale in that the amount of uncertainty grows less as the scale

of business grows larger, hence reserves of cash, of raw materials, of machinery, and even of labor can be smaller than if the same amount of business is split up among a number of smaller units. This applies, however, only in so far as the uncertainties to which the various smaller units would be exposed are independent of one another. One bank with a million dollars of deposits can safely carry smaller reserves than ten banks with one hundred thousand dollars of deposits each, so far as the uncertainty of day-to-day demands is concerned, or the hazard of individual independent failures among their borrowers, but against such a hazard as war or panic the larger bank needs as large a reserve as would the ten smaller ones. So with life insurance companies. The ordinary variation of death claims from year to year will be less in a large company than in a small one, but the variation due to an epidemic is likely to be as great with one class as with the other.

B[1]

The amount of uncertainty depends on the amount of variation to which an enterprise is exposed, the law being that the greater the range or number of distinct variations the greater will be the feeling of doubt. Now the amount of variation depends upon the period of time we take. In copper mining the probability of a great fall in price by the discovery of new mines, or of a great rise in price through expansion of commercial demand, is certainly greater if we take the next ten years than if we take the next five. The danger that the price of a manufactured article will decline owing to betterment of the machinery for making it is certainly greater the longer the period, if we admit, as we must, that more improvement is likely to occur in eight years than in two.

The amount of variation that must be endured by an enterprise is that occurring between the moment when an unfavorable alteration is perceived and the moment of withdrawal. If exodus is practicable within one year, the exposure to variation is less than if two years were needed in order to extricate one's self from the declining industry. Flexibility is, therefore, an advantage and is a greater advantage in a variable industry than in a stable one. The flexibility depends chiefly on the extent and form of auxiliary capital employed, the

[1] Adapted by permission from E. A. Ross, "Uncertainty as a Factor in Production," in *Annals of the American Academy of Political and Social Science*, VIII (1896), 113–19.

distinction just made resolves itself into a contrast between businesses with fixed capital and those without.

The effect of superadding to differences in flexibility the element of uncertainty in price is to exaggerate these differences. Differences in flexibility of little moment in the stable branches have important consequences in the more speculative branches. One effect, of course, is to check the flow of industrial energies into doubtful enterprises which demand a heavy initial outlay. The clearing of land for a special crop such as coffee or cane, the building of sluices for mining a speculative metal, the creating of an irrigation system for a valley depending for access to market upon a very dubious railroad expansion, are cases in point.

Another effect is to hold production down to an inferior technique. Articles of fashion are made by hand rather than by machinery, not so much because hand labor is superior, as because it involves less outlay of capital. The same thing is visible when the business is under the menace of a possible substitute. The effects of rapid electrical development upon the technique of gas works, of the possible cable car, upon the ratio of circulating capital to fixed in the conduct of horse-car lines, of the ubiquitous trolley car upon the building of Macadam roads exemplify this. A business facing a squally future must not spread much sail. Where there is doubt of the outcome the entrepreneur must hold himself in light marching order, ready to move at a moment's notice.

The uncertainty as regards the yield of product sets up a current of amalgamation that favors large-scale industry. In almost any line of production minor fluctuations are constantly occurring in the different parts of a business. As, however, these succumb to an average within the single enterprise, they inspire no uncertainty and are not disturbing factors. The larger the enterprise the more do the variations incident to its branch of production reduce to an average and disappear, the fewer are the uncomprehended species of variation. For instance, to the owner of a cow the loss at calving time is uncertain, while to the owner of a great herd this loss appears as a regular percentage that can be computed and allowed for. Even to the rancher the loss by stampede is uncertain, but to a great cattle syndicate with many herds, the loss from this source can be roughly estimated in advance. Again, in a small refinery the possibility of over-doing a batch of oil or sugar may be a source of serious uncertainty, while in a large refinery the law of the average prevails.

Thus with increase in the comprehensiveness of the individual enterprise, the species of variation that do not succumb to the average but remain sources of doubt, become fewer. This gives rise to three types of enlargement; to *amalgamation* or the fusing together of co-ordinate processes as, for instance, in mixed farming; to *comprehension* or the fusing of successive processes as, for instance, in the pottery industry; and to *expansion*, or the repetition of the same operations as in the big cotton mill or refinery.

It follows then that in the variable branches the small enterprise will be duly starved, while the large undertaking will flourish beyond its economic limit. It will be observed, however, that where we have to do with the fluctuations of price rather than of yield this effect is absent. The movements of price affect the entire product at a given moment and are not overtaken and engulfed as an enterprise expands.

Now most variations of product, especially in mining or manufacturing, are confined to the individual establishment; variations of price, however, extend to all enterprises in the same branch of production. From this it follows that the one least able to make a doubtful venture is the small undertaker who embarks his entire capital; abler is the rich man who supports several other enterprises in the same line of business; ablest the man of ample resources who has many investments in widely sundered departments of activity. Our first discovery, then, regarding business management is that poor men will confine themselves to the steadier branches, while the variable branches will fall into the hands of men of large resources; and unless there are enough rich men to man the speculative branches there will be an undersupply, leading to high profits, which will be reaped by those who are able to engage in them. Thus monied men by capturing the lucrative fields of enterprise will widen still more the gap between themselves and the mass.

But with a rapid growth in the size of the business unit, the great fortunes prove too few to handle the big enterprises. Hence the joint-stock corporation is invoked to supply masses of capital without calling on the rich man. Albeit the stimulus to corporate enterprise has been ascribed to the growth of great industry, no small measure of its success has been due to its fitness for uncertain undertakings. By owning stock in a dozen different corporations and sharing in a dozen undertakings, one is exposed to twelve times as many variations, but each disturbs only one-twelfth as much as when one is proprietor of a single enterprise. Some of the numerous variations

will cancel each other, and the rest will locate their effects at the margin of one's fortune, where the subjective value of equal losses and gains is nearly the same.

The corporate form, therefore, is at its best a mutual insurance scheme, whereby the losses and gains due to variations are first pooled, and then shared equitably among a large number. By thus enlarging the bearing and absorbing surface, by creating solidarity through the interlacing of many private interests, the difference between the variable and the uniform type of production is minimized. While there is a corporate drift all over the field of business, we find it most pronounced in speculative branches, such as mining, boring for oil or gas, electric enterprise, building and improvement undertakings, the theatre business, and the introduction of new devices, machines, utensils, toys, foods, fibres, fuels, etc.

The unlikeness of industries in variability brings about a psychological segregation of men. Where result is extremely variable, as in prospecting, gold-mining, boring for gas or oil, blockade-running, smuggling, opening of new markets, etc., or where price is extremely variable, as bonds of doubtful governments, mining shares, trust certificates, agricultural produce, etc., certain adventurous speculative spirits crowd in and take charge. In the safe industries, on the other hand, we find the cautious, prudent, calculating men, who love precision and settledness, abhor hazard, and are terrified by uncertainty.

Summarizing we find that in the more variable branches of production:

1. The inflow of productive powers is less than it should be.

2. The ratio of fixed capital to circulating is less than is economically desirable.

3. The large concern enjoys peculiar advantage over the small concern.

4. A high rate of profit prevails, reaped for the most part by men of large means.

5. The corporate form of industry prevails more than elsewhere.

6. Special agencies are called into being, and induced to assume the consequences of certain unfavorable variations.[1]

7. The sanguine, hopeful, adventurous class crowd in, while the cautious timid class of men betake themselves to other branches.

[1] Professor Ross's discussion of this topic is omitted, as the point is discussed in a later section of the chapter.

C[1]

Forecasts based upon existing knowledge are, in general, more certain, when they are made about collections than when they are made about individual members of collection.

In general, the investment of a sum of money in equal parts in a hundred similar enterprises involves less uncertainty-bearing than the investment of the same sum in one of these enterprises. It follows further, that, if out of a hundred people, each of whom has £100 to invest, every one divides his investment among a hundred enterprises, the aggregate amount of uncertainty-bearing undertaken by the group is smaller than it would have been had every investor concentrated on a single enterprise. The physical result of the investments taken together must, however, be the same in the two cases. Therefore, whenever more or less independent uncertainties are combined together, a given result can be attained by a smaller amount of uncertainty-bearing, or, to put the matter otherwise, the factor uncertainty-bearing has been made technically more efficient.[2] The principle thus explained is fully recognized by business men, and has long lain at the root both of insurance and of much speculative dealing on Change. In modern times, however, the range of its applicability to industrial undertakings has been greatly extended by two important changes that have recently occurred. Of these the one is a legal change, namely, the concession to joint-stock companies of the privilege of limited liability; the other a natural change, namely, the development in the means of transport and communication. The ways in which these two changes have facilitated the application of the above principle may, therefore, now be examined.

So long as liability was unlimited, it was often against a man's interest to spread his investments; for, if he did so, he multiplied the points from which an unlimited call on his resources might be made. The English Limited Liability Act of 1862 and its foreign counterparts enabled investments to be spread, without evoking this danger.

[1] Adapted by permission from A. C. Pigou, *Wealth and Welfare*, pp. 100–103. (The Macmillan Company, 1912.)

[2] This circumstance, of course, permits the release, partly for immediate consumption and partly for investment, of resources which must otherwise have been stored. For example, the combination of the community's reserves in banks lowers the amount of aggregate reserve necessary, increases the capital available for investment, and *pro tanto* lowers the rate of interest. (Cf. H. G. Brown, "Commercial Banking and the Rate of Interest," *Quarterly Journal of Economics*, XXIV (1910), 743 f.)

Furthermore, intermediary organizations have been developed, capable of spreading investments on behalf of persons whose resources are too small to allow of their spreading them for themselves. Since the minimum share in industrial enterprises is seldom less than £1, the small investor's capacity for direct spreading is, even under limited liability, strictly limited. Savings banks, friendly societies, trade unions, building societies, co-operative societies, trust companies, and so forth are able, however, to put him in a position as favorable in this respect as is occupied by the large capitalist. Now, the spreading of investments obviously means a combination of uncertainties on the part of all investors who hold shares in more than one company. But, spreading, on the basis of limited liability, carries with it yet another element of combination. For, in general, each business deals directly or indirectly with many businesses. If one of them fails for a million pounds, under *unlimited liability* the whole of the loss falls on the shareholders or partners; but, under *limited liability* a part of it is scattered among the shareholders or partners of a great number of businesses. Hence, any shareholder in one business combines with the uncertainty proper to his own business some of that proper to other businesses also. It follows that the range of uncertainty, to which a normal £100 invested in industry is subjected by reason of failures, is still further diminished in amount. This advantage is additional to, and quite distinct from, any direct national gain which limited liability may give to a country by throwing a part of the real cost of its unsuccessful enterprises upon foreigners.

The development in the means of communication facilitates the combination of uncertainties in one very simple way. It puts investors into contact with a greater number of different openings than were formerly available. This effect, though of great importance, is so obvious and direct that no comment upon it is required. There is, however, a more subtle way in which the development in the means of communication works. Dr. Cassel has observed that industrial firms have, in recent times, been lessening the quantity of stock that they carry in store, waiting to be worked up, relatively to their total business. The improvement in this respect applies all round. As regards production, "there is, in the best-organized industries, very little in the way of material lying idle between two different acts of production, even if these acts have to be carried out in different factories, perhaps at great distances from each other. A modern iron-works has no large stock either of raw materials or of their

product, yet there is a continuous stream of ore and coal entering, and of iron being turned out of it." In like manner, factories are coming to keep a smaller amount of capital locked up in the form of reserve machines not ordinarily in use. The same tendency is apparent in retail trading. The ratio of the average amount of stock kept to the aggregate annual turn-over is smaller than it used to be.

Now, *prima facia*, this change of custom would seem to be of little significance. After all, a reduction in the amount of finished goods held by retailers, of reserve machinery held by manufacturers, and so on, does not necessarily imply a reduction in the aggregate amount of these things held by the whole body of industrialists. On the contrary, we are naturally inclined to suggest that the wholesaler and the machine-maker must increase their stocks *pari passu* with the decrease in the stocks of their clients. As a matter of fact, however, this suggestion is incorrect. The reason is that the wholesaler and the machine-maker represent points at which uncertainties can be combined. The development of the means of communication, therefore, in so far as it directly transfers to them the task of bearing uncertainty, indirectly lessens the amount of uncertainty that needs to be borne. Uncertainty-bearing, in short, is rendered more efficient.

See also p. 553. Technological Industry Frequently Large-Scale.
p. 745. Some Methods of Concentration of Control.
p. 724. Some Results of Incorporation.

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12. SOME RISKS OF INVESTORS AND HOW THEY ARE MET

When a business is organized, the owner of the business and his employees enter into a co-operative scheme for carrying on production, each specializing in furnishing certain services. The labor group furnish their time, skill, and energy. The capitalist-lender furnishes the use of his capital. The owner furnishes part of the capital and part of the time and skill, and assumes the responsibility for determining the fundamental policies of the business. The risk is divided between them. The laborer assumes most of the risks of physical harm, which arise in the processes of production, though the modern tendency is to transfer the financial hazard of accidents in large part to the employer. The laborer also assumes the risk that if the enterprise is unsuccessful, or if it develops in such a way that his services are no longer needed, he will find himself left without employ-

ment. The capitalist-lender subjects his investment to the hazard of complete loss if the business proves so unsuccessful that the entire capital invested in the business is sunk so that the loans cannot be repaid. The owner-manager assumes the risk of failure just so far as his resources are sufficient to cover that risk. He also risks the loss of his time and of his reputation. Statistics of business failures indicate that these risks are considerable. The number of commercial failures involving loss to creditors runs from $\frac{1}{2}$ per cent to $1\frac{1}{2}$ per cent per year. If we had statistics showing the number of businesses which bring loss instead of gain to their owner, without actually failing, or which do not yield a fair return for the time he puts into them, the totals would of course run much higher.

Incorporation is a device for making possible a further specialization of risk-bearing. As has been pointed out in chapter v, the issuance of various types of securities makes it possible for the risk to be divided among a large number of specialists, each of whom takes only a small share in the risk of any particular business, and moreover takes in each business pretty much the kind of risk he chooses, some preferring to take preferred stocks or bonds offering a high degree of safety with comparatively low return, while others take common stocks which offer the possibility of larger return but a larger degree of risk. By varying the proportion of stocks and bonds and by special contract provisions the risk can be provided in almost as many ways as there are investors.

The foregoing discussion has reference to the risk of loss of capital resulting from mistakes of investors and managers. Another risk is involved in investments of capital, however, the risk that one will not be able to get his capital back at the time he wants it even though the investment be perfectly good. From the standpoint of the debtor there is a similar risk in the possibility that he may be called upon to repay the loan at an inconvenient time. Every commercial crisis results in numerous financial embarrassments, arising on the one hand from unexpected failures to secure renewals of loans which have been counted on by debtors, and on the other hand from the failure of debtors to furnish promptly the funds which have been counted on by creditors. It is obvious that this risk, which for convenience we may call time risk, cannot be entirely eliminated so long as we employ a credit system, for if debtors are secure against having to repay advances at inconvenient times, creditors cannot at the same time be secure against the risk of failure to collect when they need the funds.

All that can be done is to adjust the interest rate to fit the distribution of the risk. This is done in various ways. In ordinary bank deposits the time risk is all on the borrower—the bank must repay the loan on demand. Consequently depositors can expect little or no interest on their balances. In the case of a callable bond, i.e., a bond which may be called in for payment at any time the issuer chooses to do so, on the other hand, the time risk is all on the lender. So great is the advantage which this gives the borrower that callable bonds cannot be sold at ordinary rates of interest except by making them callable at a price somewhat above par. Ordinary call loans can be terminated immediately at the option of either party. Such contracts exhibit the greatest variation in interest rates. Sometimes the condition of the market is such that the callability of the loan makes it very desirable from the lender's standpoint and call rates are very low. At other times the demand for such loans far outruns the supply and the rate runs up to figures never approached in any other type of loan. In long-time loans, such as bonds and mortgage loans, the contract cannot be terminated by either party without the consent of the other. Time risk is divided. Here again as in the case of call loans, the rate charged depends on the condition of the market. Usually a large number of lenders prefer to carry the risk of wanting their money before they can get it rather than the risk of having it repaid before they want it on their hands. Consequently the rate on long-time loan tends to be low. When rates are expected to rise, however, the time risk is considered heavier from the lender's standpoint on the long loans and from the borrower's standpoint on the short loans, and rates on long loans are apt to be higher.

Incorporation and the stock exchange make possible great reduction in this sort of risk. By investing in a bond or share of stock which has a continuous market, the investor can gain most of the advantages of freedom from time risk which are afforded by call loans, while at the same time the issuing corporation is free from the inconvenience of sudden and unexpected calls for the return of the capital which it is using. Of course, the investor pays for this advantage. A security which is readily marketable will sell at a higher price or, to state the same thing in another way, will yield a low rate on the investment. Hence it is important for the investor to consider before buying a security whether he really needs the advantages of marketability. If he does not, it is a waste of money to pay for it.

The most conservative, i.e., the safest, not necessarily the most profitable investment is the repayment of one's own debts. Reduction of liabilities creates no risk, and frequently saves interest charges enough to give an abnormally high return for a safe investment. This is true because payment of the debt reduces risk for the creditor without creating risk for the debtor. From the standpoint of risk, there is therefore a real social gain in the liquidation of debts. This may of course be offset by a loss in productivity of the capital.

Likewise the investment of money in one's own business may offer an investment practically free from risk, when the effect is to reduce costs or provide safeguards against risks already incurred. For instance, when $20,000 has once been invested in the equipment of a plant, $500 invested in an additional machine may return much more than normal interest through the addition it makes to the efficiency of the plant, and the risk may actually be decreased by the new investment. In like manner, even if the $500 invested in the new machine has a speculative purpose, such as increase of output to meet a probable but uncertain demand, once the machine is bought, $20 expended in keeping it in repair may yield an enormous return, quite free from additional risk.

Investments to start new businesses, on the other hand, are always speculative. Inside information or special fitness for an enterprise may make an opportunity almost riskless for an individual, but as a general rule the fact that an opportunity has not been developed already means that its results are uncertain.

The purchase of high-grade bonds of industrial and public-utility enterprises offers a high degree of safety, chiefly because of the large margin which usually exists between the income required to meet charges on them and the normal income of the business, secondarily because they are usually secured by direct claims on assets of ample value. Here it will be noted that the investor is protected against a partial failure of the business. If there is a complete collapse the charges cannot be met, unless out of accumulated earnings of the past, and ordinarily the assets pledged lose much of their value. All forms of security depend ultimately on earning power, and are subject to the hazards of the business in greater or less degree. But when the interest on a bond requires, say 25 per cent of the anticipated earnings, a shrinkage of 80 per cent in net means only a 20 per cent shrinkage in the amount available for interest, while a 60 per cent shrinkage

leaves the bondholder unscathed. A complete failure wipes out the bondholder just as it does the stockholder, unless the investment can be extricated and the assets applied to some other use. The probability of loss is thus roughly calculable on the basis of (*a*) the variability of the earnings, and (*b*) the extent of the margin of safety. The same considerations apply to the purchase of real-estate mortgages, and to loans to individuals.

On the other hand, final equities, such as ownership of individual businesses or of common stocks of corporations, have their speculative character increased by the creation of prior liens. In the case cited above, the issuance of bonds sufficient to absorb 25 per cent of net income in fixed charges means that a 60 per cent shrinkage in net income cuts off 80 per cent of the stockholders' return, and a 75 per cent shrinkage wipes it out entirely. The thinner the equity the greater the risk *to both parties*. Common stocks, however, are always speculative, even if preceded by no prior liens of any kind; for the accumulated assets and the prospects of earnings of any business, no matter how stable, are always changing, and the full weight of these changes falls on the common stock. Prior liens intensify the risk; they do not create it.

Aside from priority of lien the most important method of reducing investors' risk is through diversification. This is an application of the law of large numbers. A corporation engaging in a wide variety of enterprises gains stability (though it may lose in efficiency enough to offset the advantage of diversification). The Cities Service Company early in 1921 reports greatly reduced income from oil operations on account of the fall in the price of petroleum, but at the same time the largest earnings in the company's history from its public-utility properties. Combination of investments affords the same advantage to the individual investor, provided the investments are not dependent for their prosperity on the same conditions. Deposits of funds with banks, investments through building and loan associations and investments trusts, and the purchase of insurance and of annuities, if the institutions are honestly managed, offer an almost perfect assurance of safety, largely because they depend on the success of a great number and variety of enterprises, some of which will almost certainly fail, but the great majority of which will not, unless as the result of a collapse of the present organization of industry. So the obligations of a government are better than the obligations of the business units controlled by that government only because the power to tax gives

the investor a prior lien on the earnings of these businesses, and because the political unit is large enough to secure to the largest extent the advantages of diversification. Bonds of the governments of highly specialized communities are risky.

See also p. 434. Corporate Securities Viewed as Instrumentalities.

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13. INSURANCE AND RISK-BEARING

[This selection marks the shift of the discussion over to a consideration of the transfer of risks to others, which as a rule is accompanied by the elimination of part or all of the risk.]

Specialization has produced numerous types of organization to which it is possible to transfer certain of the risks of business. Indeed, specializing in risk-bearing is one of the most striking phases of our modern differentiation of functions and functionaries. The most conspicuous illustration is of course the insurance company, but there are a great many others. Corporate suretyship, guaranty of real-estate titles, guaranteed collection services, and the hedging facilities offered by produce exchanges are illustrations.

The assumption of risks for others looks at first like an extremely hazardous way of building an income. It is not necessarily, however, more risky than other forms of business enterprise, for the risk-bearer is usually better able to carry the risk than is the one from whom it is removed. This superiority may be due to superior knowledge of the situation, as when a title-guaranty company guarantees the validity of a title to real estate. It may be due to superior facilities for preventing the harmful event against which protection is sought, as when a steam-boiler insurance company issues a policy to protect the owner of a plant and then furnishes an elaborate and efficient inspection service to reduce the hazard of loss. Often it is due merely to facilities for combining large numbers of risks and thus reducing the area of uncertainty. For all forms of enterprise based on the assumption of risk for others, the chief hazard is not the hazard insured against, but the risk of failing to get sufficient business to furnish a working basis for the law of large numbers, or to repay the costs of organization.

The business of insurance illustrates all three cases. Suppose that in the space of five years on an average 1 per cent of buildings of a

certain type are burned and that the cost of selling insurance, keeping track of the business, investigating claims, etc., together with the profits of the insurance company, brings the cost of insurance on such buildings up to 2 per cent. Suppose A insures and B refuses to do so. It is evident that in the long run A will pay out twice as much for insurance premiums as B will lose by fires. But if B has only one or two buildings, the "long run" necessary to make him fairly sure of this saving will be a great deal longer than his lifetime. Instead of saving the difference between the amount of the premiums and the average of normal loss, he gambles for the saving of a larger amount. If he is lucky enough to have no serious fires, he saves the whole premium. If his building is destroyed, he probably will never live long enough to save the amount lost out of his insurance premiums. Moreover, if he has his whole capital sunk in one building he has no chance to save any of the loss in this way until he has accumulated enough to put up another building. If the building is used for business purposes, moreover, its destruction is likely to mean not only the loss of the value of the building, but also the loss of business, goodwill of customers, etc. Part of this loss is unavoidable, but an insurance policy which enables one to rebuild quickly or to pay off debts which have been secured by the building may enable him to save a large part of this indirect loss.

Special policies to indemnify such indirect losses as cessation of rent payments, stoppage of production, and in some cases anticipated profits, are sometimes written. These are relatively new types of insurance. Losses of this indirect character are not taken into consideration in figuring liability under the standard fire policies.

One of the most important risks with which we have to deal is that which arises from the uncertainty of the length of human life. This takes two forms—the risk that one may live so long as to use up the funds which he has provided to support himself in old age and the risk that he may die before the end of his normal working life. Each contingency needs to be provided against.

The first is taken care of in large part by the method of reserves, the individual setting aside a part of his earnings as a provision for old age, a larger part in many cases than would be necessary if the length of life were known. The life annuity is a special device for taking care of this risk. This is a contract whereby an insurance company or other corporation agrees for a fixed sum to pay a given individual a stipulated income so long as he lives. For one who will

live only an average period the contract is not ordinarily an attractive investment, but it relieves him of the risk of using up all his savings and coming to want because of an unexpectedly long life. The pure endowment is another contract which insures against a risk arising from the length of life. It is similar to an annuity except that the person taking out the contract pays his money in annual instalments for a term of years, and at the end of that time receives a lump sum. If he dies within the stipulated time nothing is paid by the company. Such contracts have been used in Europe by parents to provide for the expense of higher education of their children, or to provide dowries for daughters. Endowment-life policies combine pure insurance and pure endowment in one contract. Usually such policies are unattractive, as the extra premium paid for the endowment feature will be lost in case of death within the endowment period and will earn only fair interest in case of survival.

The second type of risk connected with human life is the risk of death before one's normal working life is completed, with consequent loss of earnings. The way which this risk is shifted to insurance companies will serve as an illustration of what we mean by the elimination of risk through specialization and combination. For the individual, there is nothing more uncertain than the duration of his life. For the insurance company, on the other hand, the insurance contract involves very little risk. Which of the insured will die no man knows; how many will die, if the number of insured is large, can be predicted with great accuracy. Hence the company can profitably sell the insurance at a price at which it is a good bargain for the insured.

The amount at risk on a human life at any moment is the present worth of the net earnings (earnings less cost of personal support) for the remainder of the normal working life. Stated another way, it is the sum of money such that if we placed it at interest and then each year drew out of the principal enough to bring the income up to the amount the insured would have earned above his personal expenses, the fund would just last till the time the man would normally have ceased to earn. The longer the period before one would normally cease to earn, the greater the amount lost by his death, hence a logical arrangement of insurance provides for a reduction of the amount carried as one's age advances. (In his calculation the earnings figured should include only those items which would actually stop in case of the death of the insured.) Any insurance beyond this sum is a mere speculation, and anything short of it means that the dependents or

business associates of the insured are carrying some risk of loss through his death. Strictly speaking, the adequacy of other income to support the family properly is not a proper test of the amount of insurance to be carried. A rich woman ought as a matter of business policy to be insured against loss upon the death of her husband so long as he is engaged in business and his death will result in a reduction of her net income. Of course, if the loss of his earnings will be fully offset by the saving of his personal expenses, the risk of his death involves no financial hazard and in that case insuring his life is merely a speculation. In general, insurance contracts as speculative investments where no risk is involved are very poor speculations.

It will be noticed that when the question of insurance is put on the ground of financial hazard, others than his family have an interest in a man's life. In recognition of this principle, business firms are coming more and more to protect themselves against loss from the death of valued employees and officers. Base-ball corporations sometimes insure the lives of their players. The Roycrofters carried a million dollars' insurance on the life of Elbert Hubbard. Whenever an individual is so valuable to his firm that the saving of his pay will not compensate for the loss of his services, such insurance is proper.

Outside the fields of fire and life insurance, the most important branch of the insurance business is marine insurance. Newer types which are gaining rapidly in popularity are burglary, plateglass, automobile, and credit insurance. In all these cases the principle is the same. If a business has a large enough number of risks and if the risks are independent of one another, it is likely to be cheaper not to insure, for unless the insurance company receives a good deal more in premiums than it pays out for losses it cannot continue to do business. A railroad company need not insure its station buildings, and a large business owning many buildings with plate-glass windows need not insure them against breakage. The amount paid out in premiums will be greater than the amount needed to replace the damage. In the same way a large number of small risks of different kinds may be allowed to offset one another. Wherever such a distribution of risk cannot be secured, however, assuming that the expense loading and profits of insurance companies are not excessive, all insurable risks should be insured against, for the insurance company having a wider distribution of risk can definitely count on a smaller variation in the number of losses than can any one individual, and hence can get along with smaller reserves withdrawn from active business use to guard against the impairment of working capital.

The field covered by insurance companies, however, is much narrower than the field of risk involved in carrying on business. An insurance company cannot write policies to cover hazards which are incalculable. To meet the need for insurance or for protection against various types of loss where no statistics are available from which to calculate the expected loss, the Lloyd's type of so-called insurance has been developed. In this type of contract, a large group of private insurers enter into a contract by which they agree to recompense the insured for his loss, dividing the cost between themselves. For example, people in Washington owning property along the line of march of the inaugural procession sometimes insure themselves. against loss from bad weather on the fourth of March through the London Lloyds. The insurers in this case do not secure a distribution of risk, for if they have a loss on one policy they will have a loss on every policy of this type. Protection against drought is of the same character. In these cases the insured is relieved himself of risk, but instead of the risk being eliminated by combination it is simply assumed by the insurer in what is practically a gambling spirit. So long as such policies are written to cover a *bona fide* risk and not for speculation, they are as useful as any other type of insurance, but the device obviously lends itself admirably to gambling and is often used for that purpose. In the earlier days of life insurance it was permissible for anyone to take out insurance on the life of anyone else, and policies, practically of the Lloyd's type, on the lives of public men were often taken out purely for gambling purposes.

14. RISK-BEARING THROUGH SPECULATIVE CONTRACTS

[The closing paragraph of the preceding selection dealt not with insurance, properly so called, but with a speculative contract. This present selection continues the discussion of such contracts.]

A. THE TYPICAL SPECULATIVE CONTRACT OF ORDINARY BUSINESS[1]

In our contractual society, speculative contracts form one of the leading ways of transferring and ultimately of reducing industrial risks. These speculative contracts are so numerous and so well known that a simple illustration will suffice. I decide to build a house.

[1] Taken by permission from L. C. Marshall, "Speculative Contracts," in *Readings in Industrial Society*, pp. 501–2. (The University of Chicago Press, 1918.)

A contractor assumes the task. He then proceeds to make subcontracts with the purveyors of lumber, bricks, and other materials to the effect that these materials shall be delivered to him at a certain future time and at a certain price. The main contractor has thus contracted himself out of risk with reference to price changes in these materials.

Our contractor has thus been relieved of much of his risk, but has this operated to diminish the industrial risks of society? At first glance it would appear that the risks have merely been shifted. The social significance of the operation rests in the fact that the dealers in lumber, bricks, and other materials are presumably specialists who know in considerable detail the present and probable future conditions in their particular industries. They are thus presumably better judges of the risks of those particular enterprises than the main contractor, so that when the main contractor shifts risks to their shoulders it probably does mean a reduction in the total risks of society.

The foregoing illustration is typical. A man agrees to do a certain thing. He then contracts himself out of certain phases of the risks involved. True, the burden is merely transferred to someone else, but presumably this someone else is a specialist, and therein is the social defense.

It would be quite erroneous for us to think of the speculative contracts involved in trading on the organized exchanges as constituting the greater part of the speculative contracts of our day. The work of the organized exchanges has certain sensational elements, and volumes have been written upon these exchanges where sentences have not been written upon the vastly greater volume of speculative contracts entered into outside the limits of the organized exchanges.

B. THE HEDGING OPERATIONS OF AN ORGANIZED EXCHANGE[1]

Hedging may be defined as the practice of making two contracts at about the same time of an opposite, though corresponding, nature —the one in the *trade* market, and the other in the *speculative* market. A purchase in the actual grain market of a certain amount of grain at a certain price is promptly offset by a short sale in the speculative market on some large exchange of the same amount of grain for some convenient future month's delivery, with a view to cancelling any

[1] Adapted by permission from S. S. Huebner, "The Functions of Produce Exchanges," *Annals of the American Academy of Political and Social Science*, XXXVIII (1911), 342–49.

losses that might result from fluctuations in price. As soon, however, as the *trade* transaction is terminated by a sale, the speculative short sale must also be terminated, i.e., covered by a purchase on the exchange. Both contracts are entered into at about the same time, and both must be terminated at about the same time if the hedger wishes to avoid speculation.

In explaining this process of hedging let us consider the needs of a grain dealer, who, for example, purchases 1,000,000 bushels of wheat in August at $1.00 a bushel; and who, as is a customary practice, has made this purchase with borrowed funds to the extent of 90 per cent of the purchase price, the banker holding the grain paper as collateral for the loan. The banker is protected because he knows that at any time he can, owing to the existence of a large continuous market, sell out the buyer. But what shall we say of the grain dealer's risk? Is he not running a tremendous risk by buying so much wheat on a 10 per cent margin when in the course of a week or two, owing to world-wide conditions over which he has no control, wheat may decline from 10 to 20 cents per bushel? If there were not some way in which he can insure himself against such a contingency it would be doubtful if our large elevator companies could remain in business for any length of time, especially with their trade profit, under present competitive conditions, limited to one or two cents per bushel. In fact the leading interests in the grain business have testified before Government Committees that hedging is absolutely necessary to enable them to continue in business, and here it may be repeated that a hedging operation cannot be conducted without executing a short sale.

Now just as soon as the grain dealer purchases the wheat in the actual wheat market he at once gives an order to sell short on some exchange an equal amount in the speculative market for, let us say, September delivery. These two transactions are entirely distinct. The grain dealer does not intend to deliver the wheat he actually holds in fulfilment of this short sale. Now let us suppose that wheat rises to $1.10 per bushel. In that case he has a profit of 10 cents per bushel on the wheat he owns, since he purchased it at $1.00. But, as we have seen, the price of wheat is a world price made such by the operation of arbitrageurs, and there is every reason to believe that if the price of cash wheat rises 10 cents a bushel the September option will also have a rise of 10 cents, or approximately that amount. Since the grain dealer sold short an equal amount in the speculative

market he suffers a loss on that transaction of 10 cents per bushel. The profit on his *trade* transaction is cancelled by his loss on the paper transaction. On the other hand, supposing that wheat declines 10 cents per bushel, the grain dealer loses 10 cents upon his trade wheat, but the 10 cents lost here will be cancelled by the 10 cent rise on the short transaction. In other words, whether wheat should rise to $2.00 a bushel or decline to 50 cents a bushel, this dealer is always even as regards the given market. Whatever he makes by price fluctuations on the wheat he holds is lost on his paper transaction and vice versa. If, when September arrives, he finds that circumstances are such as to make it necessary or desirable to hold his wheat longer, he may close out his September short sale in the speculative market and at once enter into another sale for a later month. This shifting of hedging transactions from one month to another month is a very common practice, although where the party interested is not the holder of a seat on the exchange, it involves accumulating commission charges.

The question will at once be asked, since the dealer is always even, how does he make his profit? Here we must distinguish clearly between the *trade profit* and the *speculative profit*. This grain dealer wishes to avoid speculative risks and therefore makes use of the speculative market for the purpose of hedging. His business consists in conveying his wheat, let us say, from Chicago to New York, and it is in the handling and transportation of the grain from this market to another market that he expects to make a *trade profit*, which is the result of his knowledge of the business and his ability to render this particular service in competition with other dealers.

The explanation given here will apply differently in different industries to meet the needs of those who wish to use the exchange for hedging purposes.

C. SOME DANGERS OF THE SPECULATIVE CONTRACT

The same possibility of using a contract either for the purpose of hedging a legitimate risk or for the purpose of creating a gambling risk which we saw in the Lloyd's contracts arises in connection with "future contracts" on the produce exchanges. When a grain merchant sells a future contract to hedge against a fall in prices while he is marketing his purchases of cash grain, or a flour miller buys a future contract to protect himself against loss while he is manufacturing flour which he has agreed to deliver, they are securing protection against a definite risk in much the same way that one secures protec-

tion against unknown hazard through Lloyd's policy, but in both cases the only way that the insuring or hedging individual gets rid of his risk is by transferring it to someone else who assumes it as a speculation. The whole machinery of the produce exchange finds its justification in the facilities which it affords for carrying on certain types of business with a minimum risk and consequently at a minimum cost. There is no question that it is sound business policy to make use of the hedging market wherever a hedging contract can be secured on reasonable terms, but the existence of a hedging market presupposes the existence of a group of speculators who are taking the risk off the business man's shoulders, and there has as yet been found no way to prevent these contracts being bought and sold in a purely gambling spirit. A, the speculator, in relieving B of risk certainly performs a valuable service for society, but A does not know whether he is relieving B of risk or buying contracts from C who is speculating on the opposite side of the market, and if the result is to impoverish A or to bring him unexpected "easy money" the effect is quite as demoralizing as when similar occurrences take place through the medium of the race course or the roulette wheel.

In any case it is clear that the *mixing* of speculation with other types of business is likely to be bad for the other business. No business man thinks of employing his surplus funds during a slack season in writing insurance policies on his friends' property, and the employment of surplus funds in speculation by business men in general in order to furnish other business men with protection against price fluctuations is quite as unsound. This is true, not so much because the man who speculates as a side line lacks expert knowledge, but simply because it diverts energy and time from the principal business into the side line, and, more important, creates a new and unnecessary hazard affecting the working capital of the principal business. Society needs speculators, but the proper source for speculative funds is the accumulation of surplus funds in the hands of those who are not actively engaged in other business and can afford to take a series of losses without flinching in the expectation of making it back in the long run. The great weakness of present-day speculation is that there are too many people furnishing speculative contracts who, either on account of the needs of their other lines of business or on account of absolute limitation of funds, cannot stick through the long run and are "wiped out" by the first or second unexpected turn of the market.

15. GUARANTY, SURETYSHIP, AND UNDERWRITING

The type of specialization which involves the assumption of risk by a specialist who believes that he can foresee the outcome of a venture and decides that there is no risk, or a smaller risk than is generally estimated, finds most of its illustrations in speculation. Outside this field illustrations are found in contracts of guaranty and suretyship and in certain types of so-called insurance which are really more properly considered as surety arrangements. For instance, a title insurance company guarantees real estate titles, not by figuring the percentage of losses and calculating a premium to cover the risk, as is the insurance practice, but by searching the records until it is satisfied that no risk exists. For the private individual who cannot conduct this investigation for himself, the contract removes an important risk; for the company the risk is negligible. So with individual guaranties. When a friend signs a card to enable you to draw books from the municipal library, he does not inquire what per cent of guarantors are called upon to make good the losses sustained by the library; he depends absolutely upon your performing your obligations, though he is doubtless aware that some people do not do so. He knows you are individually a safe risk, whatever the average may be. The library, not knowing this, considers that the guaranty reduces a real risk. In the same way, when A indorses B's note as an accommodation he may know perfectly well that 1 per cent of the business men in the United States are likely to fail within a year, but he does not figure that he is running a 1 per cent risk; he believes B is all right and will not be among the 1 per cent. If he had any doubt about it he would probably decline to furnish the indorsement. A bank acceptance is exactly the same sort of transaction. The bank accepts drafts drawn on it on account of a customer, depending on him to provide the necessary funds before the draft falls due. It does not charge an actuarial premium based on statistics of risk; it merely charges a commission for the service. Unless it considers itself safe it does not accept the draft. To the drawer of the draft, who does not share the bank's knowledge or its confidence in the customer's reliability, the bank's acceptance makes the transaction less risky.

In foreign-exchange transactions certain individuals or firms of excellent standing buy the paper of small firms which have not established their reputation, add their own indorsement and resell the paper in the open market at a higher price. They know, or at least they are convinced, that the less known firms are sound; but the general

public not being so fully informed, the well-known indorsement adds to the market value of the paper. Here again we have a reduction of risk through specialization in securing more adequate information than is generally available.

16. ORGANIZED SURETYSHIP[1]

The business of suretyship as defined in the insurance law of New York is:

1. Guaranteeing the fidelity of persons holding positions of public or private trust.

2. Guaranteeing the performance of contracts other than insurance policies.

3. Executing or guaranteeing bonds or obligations in actions or proceedings or by law allowed.

It will be seen from this that, in a general way, except as to insurance policies, a surety company may, and generally will guarantee that a particular principal will do any lawful thing specified, provided the security is satisfactory to the surety company and a reasonable compensation is paid. To really understand suretyship, one must separate fidelity insurance from the other branches. Fidelity insurance is handled as any other line of casualty insurance would be, and while reliance is placed upon salvage, nevertheless the real reliance is upon the fact that only a certain very small proportion of men are likely to be dishonest. It is accordingly underwritten as an insurance proposition. All the other lines, sometimes specifically spoken of collectively as surety lines, are, however, underwritten upon the theory that there is a sound and competent principal who will perform the condition of the bond; and the surety does not seriously contemplate the possibility of being required to pay the bond, but considers that what he furnishes in return for the fee paid is merely a service. In other words, by signing the bond as surety, he extends credit to the principal. Suretyship is just as much the granting of credit as is banking, the only difference being that the bank furnishes to its customer the use of current funds, while the surety furnishes its customer with the opportunity to do something which he otherwise would not be able to do, or enables him to avoid the necessity of doing something until the contingency occurs which makes it certain he must do it.

[1] Adapted from advertising literature published by The American Surety Company, New York, 1919.

For convenience, suretyship has been divided into certain general classes, some of which are not at all likely to be required in connection with foreign commerce, but the following lines are all quite likely to be needed by anyone transacting business abroad

Fidelity (All Classes)	Court
Fiduciary	License, Franchise and Permit
Customs and Internal Revenue	Lost Security
Contract	Lease
Depository	

17. THE PLACE OF RISK-BEARING IN A BUSINESS ORGANIZATION[1]

An organization chart of a manufacturing and selling business is quite certain to have a place for many of the relationships which have been discussed in this book. There will be a works manager, a purchases manager, a sales manager, a finance manager, and frequently a personnel manager. These personages may or may not have the precise titles here used, but no one at all conversant with business organization would expect to see them omitted from the organization scheme, nor would he be in doubt concerning the main outline of their duties, no matter what titles were used.

But where on the organization chart is the risk-bearing functionary? In few cases does he appear on the chart with any such title attached as enables one to locate him readily. In the financial section of the organization chart there is sometimes a functionary who handles the insurance matters of the business, or in rare cases such a functionary is placed in the personnel department when the business has adopted some comprehensive policy of insuring its workers, or of insuring itself against claims by its workers for compensation because of accidents. These functionaries sometimes bear titles which indicate even to laymen that they are connected with the manager's relationship to risk and risk-bearing. In the main, however, no "risk-bearing manager" has yet been split off from the general manager and he does not seem likely to be split off in the near future. The nearest approach to a separate risk manager is to be found in those organizations which have set up comprehensive research bureaus. They are, clearly enough, aiming at the elimination of certain risks, or uncertainties, which have been confronting the business. Then, too, many busi-

[1] By L. C. Marshall.

nesses have bureaus designed to eliminate risks by preventing the harmful event. A safety engineering bureau devoted to diminishing accidents among employees is a case in point. There is, however, no knitting together of all the risk functionaries in a business into a definitely organized bureau or department which deals with risk-bearing in any way comparable to the way in which the production department deals with production. And this is not very surprising. Risk *is* uncertainty and it is natural for the owner-manager to keep definitely under his own personal control the administration of his relationships to uncertainty. It is a hard matter to delegate it.

Even where the manager is not also an owner, as may well be true of the general manager of a modern corporation, the administration of risk cannot well be delegated to some specialist subordinate manager of risks. Good administration of risks is pretty certain to require the wide knowledge and maturity of judgment of the general manager himself. This follows from the very nature of business problems and of business judgment formation.

REFERENCES FOR FURTHER STUDY

Duncan, *Commercial Research.*

Emery, *Speculation on the Stock and Produce Exchanges of the United States.*

Gephart, *Principles of Insurance.*

Huebner, *Property Insurance.*

Marshall, *Readings in Industrial Society*, chap. viii.

CHAPTER VIII

THE FORM OF THE BUSINESS UNIT

Purposes of this chapter:

1. To get an understanding of the various forms of the business unit as organization devices of which the administrator makes use.

2. To see these various forms as alternative elastic "containers" for the relationships thus far sketched in this volume.

In the preceding chapters we have surveyed five of the more outstanding relationships of the administrator—personnel, market, finance, technology, and risk. In each of these chapters we have seen the character of the problems the administrator is called upon to solve and have canvassed some of the materials of solution. In every case we have examined, if only hastily, the organization set up within businesses to deal with the specialized problems we have considered.

Now that we know what the outstanding managerial problems are, we pass in this chapter to an inquiry into appropriate "containers" for them—that is to say, we now examine the various forms of the business unit, in order to see when the individual proprietorship is appropriate; when the partnership; when the corporation; when some other form.

Probably it is fair to say that our prime concern in this chapter is that of getting a point of view. Our secondary concern is that of storing up in our minds certain factual material.

The point of view is similar to that expressed when we were studying corporate securities in chapter v. There is little use in trying to memorize the characteristics of the various forms of the business unit. Indeed, their characteristics cannot be sharply defined. There is no human being who can set forth precisely and at all points wherein an individual proprietorship differs from a partnership. A corresponding statement may be made of the partnership, the joint stock company, the corporation, and other forms. These forms shade off into one another. They are "containers" and elastic containers, at that. They are shaped and molded to meet business needs; business needs are not squeezed into cut and dried forms of the business unit.

Now this does not mean that it is a mistake to speak of business units as being of various types or forms of organization. It does mean that we must be careful to remember that they are *flexible* types.

We shall proceed in our study of these types as follows: first, we set up (Selection 1) some tests of the efficiency of the different forms of the business unit and secure some idea of the relative importance (Selection 2) of the three leading forms—the individual proprietorship, the partnership and the corporation. Then in Selections 3 to 19 we canvass *the more usual features* of the following quite incomplete list of forms of the business unit: the Individual Proprietorship, the Agency, the Ordinary Partnership, the Limited Partnership, the Partnership Association, the Corporation, the Business Trust, Consolidated Industry, Co-operative Industry.

The individual proprietorship will probably give us little trouble. All of us already have a considerable mass of general information concerning it and Selection 3 will clarify this information and make it specific. As for the other forms, in which there is association of two or more persons, we may the more readily thread our way through the maze of details if we bear in mind that the law, in its effort to give certainty to business relations, seeks to clarify two sets of relationships: (*a*) the relationships of the associates among themselves (*inter se*) and (*b*) their relationships to others (third parties). We shall find, as we go along, that part of this is cared for in the common law (this is markedly true of the agency and the partnership) and that another part has called for statute law as a means of making relationships certain.

Under the common law, an agent who acts within the scope of his authority binds his principal as truly as if the principal were himself acting. This means, of course, that unless the principal (or his agent) limits his liability when forming a contract, the liability is unlimited. Just here we have an explanation of some of the outstanding features of the partnership, for in the ordinary partnership all partners are principals and all are agents—there is "mutual agency," and unlimited liability for every partner.

Notice that this gives third persons dealing with a partnership a clear understanding concerning what to expect. Upon the one hand, unless these third persons are specifically warned to the contrary by the terms of the contract, they may hold all partners unlimitedly liable. Upon the other hand, the partners may contract among

themselves in any lawful way concerning management and indeed concerning who will, *so far as they are concerned*, assume the position of first risk. But such agreements *inter se* will not operate to limit the claim of third persons unless the third persons are aware of the situation and consent thereto.

As time has gone on, certain rules of the game have been evolved by society with respect to what will constitute making third persons "legally aware" of certain matters, as for example limitation of liability on the part of some or all of the partners. Mainly, these rules have taken the form of statute law which sets forth that, under such and such conditions, any third person who deals with a given kind of business association does so with the understanding that there is limitation of liability. These conditions will be such as seem to the legislature wise. They may provide that the word "limited" shall be used after the firm name; they may insist that a record shall be set up in some county courthouse or in some state office; they may demand publication in newspapers concerning the organization of such a company; they may do any reasonable thing by way of giving warning to third persons, and what is actually done varies from state to state. There is no use trying to memorize details. What the law seeks to accomplish is that third persons shall have "due notice" and the legislature is, speaking broadly, the judge (within reasonable limits) of what constitutes due notice.

What has just been said is as true of the corporation as it is of the various forms of the "limited" partnership. In the corporation, however, a new element comes to the front. As we know, the law makes an artificial person of the corporation and those associated in such a venture have their relationships *inter se* fixed, not by contracts among themselves, but by their contracts with this artificial person. Again, as we know, these contracts are ordinarily worked out through those devices we call stocks and bonds. This artificial person then deals with "third parties" and *it is unlimitedly liable* to these third parties unless its liability is limited in its contracts with these third parties. It is the *liability of the owners* which is limited and the extent to which it is limited depends upon the terms of their contracts. We already know (see page 436) that this artificial person must act within the rules laid down by its creator, the state. It should be clear furthermore that its owners have those rights, duties, and obligations which are set forth in their contracts with the corporation

and that these vary from state to state, from corporation to corporation, and from contract to contract.

Perhaps it is worth while to summarize what has been said thus far in a series of propositions.

1. The tests of efficiency of the forms of business organization cannot be applied with understanding without some knowledge of social control in its relationship to the form of the business unit. The form of social control of prime interest to us in this connection is law, which is of two main kinds, (*a*) common law and (*b*) statute law.

2. Since the individual proprietorship (in its pure form) means that there is but one person responsible, the law involved in his case has to do with his relations to others. It is largely common law.

3. In those forms of the business unit where there is an association of two or more persons, the law is concerned with two matters, (*a*) the relationships or the rights, duties, and obligations of the associates *among themselves* (*inter se*); (*b*) their relationships *to others* (third persons).

4. In theory at least, the law seeks to promote the welfare of society by giving "certainty" to these relationships so that all concerned may proceed about their affairs with confidence.

5. These relationships are in very large part contractual (the expression "this is a society of contractual relationships" ought to be assuming a large meaning to you), and they may accordingly have almost infinite variety. Just what these relationships shall be (1) depends upon the terms of the contract and (2) that depends upon the law of the land.

6. The forms of the business unit which have actually come into common use have arisen as means to the accomplishment of certain business ends. They can be better understood when studied with this in mind. It is of little value to try to memorize a list of these forms and the attributes applicable to each. Instead, try to realize that the forms are varying methods of fixing relationships (1) *inter se* and (2) with third persons.

7. Many puzzling details cease to puzzle if you keep in mind that one outstanding problem is that of letting third persons know the rights, duties, and obligations of those with whom they are dealing. Of course it *could* be done by having every such "deal" covered by a contract setting forth the whole story. This would be cumbersome

however and instead we commonly resort to some scheme of "public notice" of the situation, and after that notice has been given, third persons are assumed to know the situation, and to govern themselves accordingly. This statement applies particularly to "limited" partnerships and to corporations.

PROBLEMS

1. How can it be said that the corporation is the most significant form of the business unit when only 28.3 per cent of the manufacturing establishments of 1914 were corporations whereas 51.6 per cent were individual proprietorships?
2. Draw up a series of generalizations based on the table in Selection 2.
3. Survey the tests of efficiency set forth in Selection 1 and estimate the value of the individual proprietorship with respect to each.
4. Why does the individual entrepreneur still remain dominant and almost without corporate rivals in the field of agriculture?
5. Why is it reasonable that an agent, acting properly within the scope of his agency, should be able to "bind" the principal?
6. Why is it reasonable that an agent who does not act within the scope of his agency does not bind the principal? What can the third person do about it?
7. Why is it reasonable that the death of either principal or agent terminates the agency?
8. How can a third person know whether an agent is acting within the proper scope of his authority?
9. As a usual thing, is an individual proprietor "unlimitedly liable"? Is the principal unlimitedly liable for the acts of an agent?
10. Could an individual proprietor limit his liability to A by drawing a contract with A in which the limitation is clearly set forth? Could he limit his liability in his entire business by having such contracts with all persons?
11. Answer the foregoing question with respect to the limitation of liability of a principal.
12. Suppose the state should pass a law that, if an individual proprietor wore a dress suit and had a red chalk mark on his forehead when transacting business face to face with people these facts should constitute public notice that his liability in these transactions was limited. Would he have limited liability? If so, on what theory?
13. In the ordinary partnership every partner is both a principal and an agent. What does this mean with respect to liability?
14. Suppose the state should pass a law saying that it should be public notice of limitation of liability if a partnership should paint a red elephant over the door of its place of business and should have a red

elephant printed on all its business paper. What would be the position of third persons dealing with such a firm, assuming that the courts uphold this law?

15. Could an ordinary partnership limit its liability by putting a limitation in every contract into which it entered?
16. Could the members of an ordinary partnership contract among themselves settling how the administrative organization of the firm should be constituted (e.g., A to handle sales; B, personnel, etc.)?
17. Could the members of an ordinary partnership contract among themselves that A (one of the partners) should never deal with third persons? Suppose they could and that A, breaking his contract, dealt with third persons. Did this bind the firm?
18. In an ordinary partnership, do partners share losses and gains equally?
19. A, B, and C are partners. C dies and leaves his estate to his son E. What rights has E? In answering this remember that the law thinks of agency as a highly personal relationship. For example, the death of either principal or agent terminates an agency.
20. A, B, C are partners. C sells his interest to D. What rights has D? In what ways may a partnership be terminated?
21. In the eyes of the law two persons may actually be engaging in operations as partners and yet not be aware of the fact. How do you explain this?
22. In what respects does the mining partnership differ from the ordinary partnership? Why?
23. Who directs the business in a limited partnership? Who in a partnership association? How can the general public know about the limited partner? Can a special partner transfer his interest? What are the essential steps in the formation of a partnership association? Is there any particular requirement with reference to the firm name? How are shares transferred? What general answer should be made to all such questions concerning specific details?
24. Could a state pass a law providing for corporations whose stockholders should have unlimited liability?
25. Could a state pass a law laying down the rules for forming the administrative organization of corporations?
26. "By becoming a body corporate, an association gets simply the right to be regarded, in its legal relations, as though it were a being separate from those who compose it." What consequences flow from this fact?
27 "It is not true that the corporation has limited liability. Its liability is unlimited." Is this true?
28. From the legal point of view, what documents, in order of authority, determine the powers of a corporation? Do the powers of a corporation depend in any part upon common law?

29. What is a special charter? What does a charter usually contain? What do the by-laws usually contain?
30. Discuss the directors of a corporation with particular reference to the following points: number, authority, qualifications, liabilities, compensation.
31. "The following are the rights which stockholders *as a body* are usually said to possess: (*a*) to elect directors; (*b*) to amend the charter or by-laws; (*c*) to sanction or veto the selling or mortgaging of the permanent assets of the corporation; (*d*) to dissolve the company; (*e*) to sell the entire assets of the company; (*f*) to exercise any powers specially conferred by the charter."
What is the significance of the expression "as a body"? Do the stockholders always have these powers? Are these powers unlimited powers?
32. What special limitations are likely to be placed by law upon public service companies? On what theory are these limitations imposed? What are the tests of a public service industry?
33. "The stockholders are usually said to be liable: (*a*) to the corporation or to its creditors on account of unpaid stock; (*b*) to creditors if dividends have been paid out of capital assets; (*c*) to such persons and in such ways as may be indicated by the law of the state."
Explain and justify each of these kinds of liability. Under (*c*) cite some specific cases.
34. "The Kennebec Lumber Company was chartered to deal in lumber. At a stockholders' meeting, which all the twenty stockholders of the company attended, a resolution was passed by a vote of 2,971 shares of stock to 29 to build a plant for manufacturing paper. Grimes, the lone dissenting stockholder, sought an injunction from a court of equity to prevent the erection of the paper manufacturing plant." Should the injunction be granted?
35. What considerations should have weight in determining in what state a company should be incorporated?
36. In what ways may a private corporation be terminated?
37. Is the credit of a partnership higher than that of a corporation, other things being equal?
38. Why have we had the "combination movement" in modern business?
39. The following list of factors determining the scale of production has been made: (*a*) *with respect to producing or manufacturing;* (1) material, (2) labor, (3) processes, (4) administration; (*b*) *with respect to marketing:* (1) extent of market, (2) the product, (3) the character of the demand, (4) administration, including price policies; (*c*) *with respect to administration:* (1) the entrepreneur and his qualities, (2) the form of organization, (3) the adjustments with the rest of society; (*d*) *with respect to certain external factors:* (1) co-operation of business agencies, e.g., banking, insurance, (2) social control.

Can you explain the significance of each item? What has this to do with the form of the business unit?

40. Suppose that someone should discover or invent a way of producing power in small units, as cheaply as it is possible to produce it in large units. Would production on a large scale continue to dominate modern industry? Would such an invention be likely to affect the relative importance of the various forms of the business unit?
41. Can you make a general statement concerning the relationship of the size of business to its form?
42. What seems to be the future field of the partnership? Indicate precisely why.
43. Draw up in parallel columns: (*a*) the advantages and disadvantages of the individual firm; (*b*) the advantages and disadvantages of the agency; (*c*) the advantages and disadvantages of the partnership; (*d*) the advantages and disadvantages of the corporation; (*e*) the advantages and disadvantages of the joint stock company.
44. How do you think of the various forms of the business unit? Are they capital-forming devices? Are they organizing and administering devices?
45. Is the co-operative enterprise a new form of the business unit?
46. Notice again the tests of efficiency of business organization in Selection 1. Try to rank the various forms of business organization with respect to each of those tests.

1. THE TESTS OF EFFICIENCY OF FORMS OF THE BUSINESS UNIT[1]

What have been the tests of efficiency which have determined the development and survival of the different forms of business organization? What are the tests for judging their relative efficiency to-day? The general test of economy is too indefinite for easy application. We may subdivide it into some five or six more particular and specific tests, as follows:

1. *Facility of formation.*—At the outset, the question of the ease of setting up in business differentiates one form of business organization from another. Aside from the question of raising capital, which is to be made a distinct test, there are questions of suitable associates, of expense, legal restrictions, etc. The problem of promotion is a big one nowadays, and one of the promoter's usual duties is to devise a suitable organization for his enterprise.

[1] Adapted by permission from L. H. Haney, *Business Organization and Combination*, pp. 35, 36. (The Macmillan Company, 1904.)

2. *Amount of capital.*—With the growing importance of capital in production, it has become increasingly essential that the form of business organization shall be one that facilitates the acquisition of large amounts of that factor. To this end it must afford a maximum degree of security, and appeal widely to the investing class. To be sure, where small capital is required, other tests may decide, but the preceding statement holds for industry as a whole.

3. *Liability.*—Closely connected with the subject of capital is the liability point. Risk is one of the chief elements in all business, and the form which will reduce risk to the minimum will most appeal to business men, when other things are equal. A certain amount of liability is essential in order to secure a proper motivation and direction of industry, and to insure those who deal with the business organization of fair treatment; but any greater liability than will attain these ends is undesirable from all points of view. Liability may be of two kinds: financial and legal. The former concerns economic responsibility in case of insolvency; the latter concerns juristic responsibility for criminal and civil offenses.

4. *Direction.*—Assuming that the capital has been raised, what efficiency will the form of organization, within which it is combined with the other factors, afford? The test of effective direction is in reality to be reduced to several subordinate tests. First, there is motivation, which concerns the intensity and directness of the stimulus to business activity. Then there are economy of operation, continuity of policy, flexibility of organization, to mention the more important points. By flexibility is meant adaptability to changing conditions, such adaptability being needed now for capital, now for membership, and again for centralization of management.

5. *Endurance and stability.*—The degree of permanence of the various forms of organization varies considerably, and this is a matter of no small importance. It is important to the individual to be able to lay business plans for the future and to make investments running for considerable periods of time. To the society it is important that some agency should exist for continuing in uninterrupted life the undertakings upon which its members depend for the satisfaction of their economic wants. In order to satisfy these needs the organization must both be able when undisturbed to last through a long period of time, and also to resist temporary disturbing influence, that is, be stable.

Finally, (6) a *legality* test may be mentioned. In every civilized society there is a changing body of legal rules which must be observed if the form of organization is to be most effective. A form of organization like the trust, for example, is obviously inexpedient because of legal conditions. Thus the law reacts upon economy. Indeed, from the association standpoint the various forms of business organization are, as such, children whose father is economic expediency and whose mother is the law.

That the foregoing tests may be applied both from the point of view of the individual—the "private point of view"—and from the point of view of society—the "public point of view"—must ever be borne in mind.

2. RELATIVE IMPORTANCE OF THE MAIN FORMS OF THE BUSINESS UNIT

A. THE POSITION OF THE CORPORATION[1]

One of the striking features of the evolution of modern industrial society has been the development of the corporation. The statistics in this field are of such very recent origin that, except for the last few years, no quantitative study of the growth of this form of organization can be presented which can lay any claim to accuracy. From the United States Census we find that, during the decade 1899-1909, the fraction of the mineral output produced by corporation-owned mines increased from about 85.0 to 92.2 per cent, while, in the manufacturing field, during the same period, corporations increased their share of the value added by manufacturers from approximately 63.3 to 77.2 per cent. We know that transportation by water, rail, and wire has been mainly carried on by corporations for several decades. In commercial enterprises, the general impression is that the stock company is gradually playing a more important part than formerly. Only in the field of agriculture does the individual entrepreneur—the man who controls and directs his own business—still remain dominant and almost without corporate rivals. A rough estimate indicates that, of the total products of American industry in 1899, some 39 per cent, or approximately seven billion dollars' worth, and, in 1909, about 44 per cent, or thirteen billion dollars' worth, were turned out by corporation-owned plants.

[1] Adapted by permission from W. I. King, *The Wealth and Income of the People of the United States*, pp. 208–11. (The Macmillan Company, 1915.)

B. RELATIVE IMPORTANCE IN MANUFACTURING INDUSTRY[1]

Statistics concerning the character of ownership or legal organization of manufacturing enterprises are given in the table below for all industries combined. The table shows for the censuses of 1914, 1909, and 1904 the number of establishments under each form

CHARACTER OF OWNERSHIP	NUMBER		WAGE-EARNERS		VALUE OF PRODUCTS		
	Establishments	Per Cent Distribution	Average Number	Average per Establishment	Amount	Average per Establishment	Per Cent Distribution
All classes:							
1914.....	275,791	100.0	7,036,337	25.5	$24,246,434,724	$87,915	100.0
1909.....	268,491	100.0	6,615,046	25.0	20,672,051,870	76,993	100.0
1904.....	216,180	100.0	5,468,383	25.0	14,793,902,563	68,433	100.0
Individuals:							
1914.....	142,436	51.6	707,568	5.0	1,925,518,298	13,518	7.9
1909.....	140,605	52.4	804,883	6.0	2,042,061,500	14,523	9.9
1904.....	113,946	52.7	755,923	7.0	1,702,830,624	14,944	11.5
Corporations:							
1914.....	78,151	28.3	5,649,646	72.0	20,181,279,071	258,174	83.2
1909.....	69,501	25.9	5,002,393	72.0	16,341,116,634	235,121	79.0
1904.....	51,097	23.6	3,862,698	76.0	10,904,069,307	213,399	73.7
All others:							
1914.....	55,204	20.0	679,123	12.0	2,139,637,355	38,835	8.8
1909.....	58,385	21.7	807,770	18.0	2,288,873,736	39,203	11.1
1904.....	51,137	23.7	849,762	21.0	2,187,002,632	42,768	14.8

of ownership, the average number of wage-earners, and the value of products for the establishments in each group. In this and the other tables presenting the statistics of ownership the group "All others" includes establishments operated by firms, co-operative associations, and miscellaneous forms of ownership that could not be classed as "Individuals" or "Corporations."

Establishments under individual ownership are more common than those under any other form, representing in 1914 more than half of the total number in all industries combined. The value of products, however, reported for such establishments, represents but 7.9 per cent of the total.

The most important distinction shown is that between corporate and all other forms of ownership. Of the total number of establishments reported as engaged in manufacturing industries in 1914, 28.3 per cent were under corporate ownership. The corresponding figure for 1909 was 25.9, and for 1904 was 23.6 per cent. While

[1]Adapted from *The Abstract of the Census of Manufactures, 1914*, pp. 374, 385 and *Thirteenth Census of the United States*, VIII, 135 ff.

corporations thus controlled only about one-fourth of the total number of establishments, they gave employment to a large proportion of all wage-earners reported, namely, 80.3 per cent in 1914, 75.6 per cent in 1909, and 70.6 per cent in 1904. The value of the products of the factories operated by corporations represented 83.2 per cent of the total value of products for all establishments in 1914, 79 per cent in 1909, and 73.7 per cent in 1904. These figures show that during the decade the corporate form of ownership increased so greatly that it represented an appreciably larger proportion of the manufacturing interests of the country in 1914 than in 1904.

As a rule, the larger the average size of the establishments in an industry, the higher is the proportion of establishments controlled by corporations and the proportion of business done by corporations. In the industries included under the designations "cars and general shop construction and repairs by steam-railroad companies" (steam-railroad repair shops) and "cars and general shop construction and repairs by street-railroad companies" (street-railroad repair shops) all but one of the establishments in 1909 were under corporate ownership, both steam and street railroads being almost invariably operated by corporations. All the establishments engaged in the manufacture of rubber boots and shoes and all but one of those engaged in the locomotive industry and in the smelting and refining of copper were operated by corporations.

In 32 of the 86 leading industries in the United States, establishments under corporate ownership reported 90 per cent or more of the total value of products in 1909. These industries comprise, in addition to those named above, "agricultural implements," "automobiles, including bodies and parts," "brass and bronze products," "cars, steam-railroad, not including operations of railroad companies," "cement," "chemicals," "clocks and watches, including cases and materials," "coke," "cordage and twine and jute and linen goods," "cotton goods, including cotton small wares," "electrical machinery, apparatus, and supplies," "fertilizers," "fire-arms and ammunition," "gas, illuminating and heating," "glass," "iron and steel, blast furnaces," "iron and steel, steel works and rolling mills," "iron and steel, bolts, nuts, washers, and rivets, not made in steel works or rolling mills," "liquors, malt," "oil, cottonseed, and cake," "paper and wood pulp," "petroleum, refining," "pottery, terra-cotta, and fire-clay products," "rubber goods, not elsewhere specified,"

"silverware and plated ware," "stoves and furnaces, including gas and oil stoves," and "wire." In all but one of these industries corporations controlled more than half of the total number of establishments. In most of them the average size of establishments is large.

On the other hand, in only 12 of the 86 leading industries did establishments under corporate ownership contribute less than 50 per cent of the total value of products in 1909. These were the industries "artificial flowers and feathers and plumes," "bread and other bakery products," "butter, cheese, and condensed milk," "clothing, men's, including shirts," "clothing, women's," "fur goods," "gloves and mittens, leather," "jewelry," "marble and stone work," "millinery and lace goods," "mineral and soda waters," and "turpentine and rosin." In only 3 of these—the fur goods, women's clothing, and turpentine and rosin industries—did the proportion fall below one-fourth. In all of these 12 industries the average size of establishments is small.

See also p. 553. Technological Industry Is Frequently Large Scale Industry.

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3. THE INDIVIDUAL PROPRIETORSHIP[1]

The individual proprietorship has several marked advantages which make it a prominent type of business organization. In the first place, the individual proprietor can ordinarily undertake any kind of business enterprise except those which are assumed by the government exclusively, or are forbidden on grounds of public policy, or require special licenses. Thus an individual business enterpriser cannot, in the United States, undertake the transportation of the mail, or engage in coining money, or at the present time engage in the lottery business. But outside of those business activities which are assumed by the government, forbidden entirely, or permitted by license only, the individual proprietor is free to enter into any business enterprise, conduct it as long as he pleases, and retire from it whenever he has completed all the contracts which he has entered into. The ability of the individual proprietor to enter into business undertakings without any formality and retire in the same way is an important factor in promoting business enterprise and in keeping the several lines of business activity evenly developed.

[1] Adapted by permission from M. H. Robinson, *Business Administration*, pp. 29–32. (La Salle Extension University, 1911.)

In the second place, the individual proprietor, having no one else to consult, can act in all emergencies with greater promptness than the more complex forms of organization. He may thus take advantage of business opportunities that are impossible in the case of partnerships or corporations. For the same reason he may also avoid certain dangers that ordinarily surround, and sometimes destroy, business enterprises. Of course the ability to act promptly is not an unmixed business blessing. It is often the case that hasty action is the direct cause of business failure.

In the third place, the individual proprietor can keep his own affairs to himself and, while the element of secrecy is of less and less importance as business management becomes more of a science and less of an art, still the more competitors know of one's business plans and processes, the less the chances of ultimate success.

In the fourth place, since every business enterprise has its own peculiar risks and those who undertake the organization and management reap the profits from their exclusive operation, it follows that the same parties ought to suffer the natural penalties that result from unsuccessful management. In the individual proprietorship this is ordinarily the case. Those who manage business enterprises well prosper; those who do not soon fail and take their proper places as superintendents and laborers. The law of survival of the fittest thus is applied with almost relentless certainty to business enterprises operated under the control of the individual proprietor, and rapid progress in the science and art of business management is a necessary result.

There are, however, several particulars in which the individual proprietor fails to provide successful business organization for particular kinds of businesses. The more important of these disadvantages may be enumerated and placed in contrast with the strong points of this type of organization. In the first place, owing to the demand for large organizations in certain industrial groups, the capital at the command of any one individual is often insufficient for the construction and operation of a plant of the greatest economy; hence individuals combine their capital. In the second place, large enterprises often require business judgment, skill, and ability beyond the capacity of any one man to furnish; hence several men enter into a combination to conduct jointly a business enterprise in order that they may secure the benefits of their co-operative wisdom. In the third place, in accordance with the teachings of the modern

theory of risk, business men hesitate to put all their eggs in one basket and undertake the risks that follow from such a policy. Moreover, the individual cannot avoid the risks by organizing and managing many small enterprises, for any one of such enterprises is liable for the losses suffered by any other of the business enterprises, and this scattering of the capital within the control of any one individual prevents him from securing the economies of a large scale of production.

For these reasons the individual proprietorship is adapted to the following classes of industrial enterprises only: those where the capital required for efficient production is small; those where the risks of conducting the enterprise are relatively slight; those where the operations are simple in character and well understood by the average business man. Consequently organizations in which the skill and capital of a number of individuals are united have largely superseded the individual proprietor in all the industries which require large-scale production to secure the greatest efficiency.

See also p. 671. Elimination by Combination of Risks.

4. AGENCY AS AN ORGANIZATION DEVICE[1]

One of the most significant, pervasive, and, perhaps, obvious facts in the study of modern society is the well-nigh universal utilization of agency as an organization device in the conduct of business. So universal is this fact that it can scarcely be more than an interesting speculation to inquire how far business activities are carried on by those acting in representative capacities.

Agency is a basic principle underlying all forms of business association. The nature and characteristics of partnership, joint-stock companies, and corporations can be understood only in terms of this fundamental hypothesis that one person can act for and in the place of another. Each of the organization devices, of course, is marked by features more or less peculiar to itself, but in the final analysis each is based upon the relation of principal and agent.

The objects for which an agency may be formed are almost as unlimited as human activities. There are in fact relatively few things which cannot be done as well through an agent as in person. Unlawful undertakings, commission of crimes, the doings of acts contrary to public policy, cannot be legally delegated to an agent;

[1] By W. H. Spencer.

certain acts, very personal to one, such as voting, taking an oath, or entering into the marriage relation, cannot be performed through an agency; and as a general rule delegated authority cannot be re-delegated.

The formation of an agency is on the whole a fairly simple and non-technical transaction. The relation arises out of a voluntary agreement of the parties and is not ordinarily imposed upon them without their consent. It may be expressly made or it may be left to implication. It may originate in a contract or it may result from a gratuitous promise of the agent. The constitution of another as an agent need not be evidenced by any writing in the absence of a statute requiring written evidence. Where an agency does arise out of a contract, the usual principles of the law of contracts, with reference to the capacity of parties, mutual assent and consideration, apply. The main consideration in the creation of an agency, at least from the principal's point of view, is a careful delineation of the powers of the agent.

The agency relation has for its main purpose the carrying of the principal to a third person through the medium of the agent. Its operation is, therefore, tripartite; its operation always affects three different parties and produces, therefore, three distinct groups of consequences: (1) consequences as between the principal and the agent; (2) consequences as between the principal and the third person; and (3) consequences as between the agent and the third person.

1. As between the principal and the agent, on the one hand, there is a series of duties which the principal owes to his agent by reason of the relation. The principal is under an obligation to compensate the agent for his services except in those cases in which the agent has undertaken to serve the principal gratuitously. The principal must reimburse the agent for all money which the latter expends on behalf of the principal in the course of his employment. Finally, the principal is under a duty to indemnify the agent against losses which he may sustain while acting for his principal.

On the other hand, there is a series of duties which the agent owes to the principal. The agent is under a duty to obey all instructions which his principal may impart to him. He owes a duty to the principal to exercise a reasonable degree of care and prudence in the performance of his duties. It is said, however, that an agent who undertakes to serve a principal gratuitously is under a duty to

show only a slight degree of care in the exercise of his authority. The agent is under a duty to manifest a high degree of good faith in all of his dealings with his principal and on his behalf. The relation between the principal and agent is a fiduciary one and the agent is not permitted to take advantage of it for his own benefit. Finally, the agent is under a duty at periodic times to account to his principal for all money which has come into his possession for his principal.

2. What now are the consequences of the operation of the agency relation as between the principal and a third person? In general it may be said that the principal is bound by every act and contract of the agent within the scope of the latter's authority. Stated negatively, the principal is not bound by acts and contracts which are outside the scope of the agent's authority. It is impossible in this connection to indicate in detail what is included in the phrase, "the scope of the agent's authority." Speaking broadly, however, the scope of the agent's authority, in the first place, includes all of those powers which the principal expressly confers upon the agent and subjectively intends that he shall exercise; it includes, in the second place, any power which the principal leads the third person reasonably to believe that he has conferred upon the agent.

It quite frequently happens that an agent exceeds his authority and purports to do some act for his principal which he has no power to do. By hypothesis, the principal is not bound by the act. He may, however, wish to reap the advantage of the act notwithstanding the fact that it was done in excess of authority. This he may do by ratification. Ratification is simply an expression of intention on the part of the principal to be bound by an unauthorized act of his agent. Ratification, as a general rule, binds the principal to the third person and the third person to the principal. It is a cure for lack of authority. Subsequent ratification, as it is sometimes said, is equivalent to precedent authority.

The principal is not only bound by acts and contracts of his agent within the scope of the latter's authority but he is also liable for all torts or wrongs committed by his agent within the course of his employment. The principal chooses the agent; the agent acts for the principal and under his direction; the principal gets the benefits of the agent's activities. Why then should he not bear the burdens incident to the relation? Why should he not be held liable for wrongs committed by the agent within the course of his employment? Thus reasoned the courts and the principle stated is a well settled rule of the common court.

3. Now as to the consequences of the operation of the relation between the agent and the third person. The general rule is that the principal and the principal alone is bound by contracts which the agent makes within the scope of his authority. However, there is one very important exception to this general rule: If the agent, as is frequently the case, fails to disclose his principal, the third person may at his election hold the agent or the principal, when he is disclosed, on the contract.

If the agent exceeds his authority in making a contract, the principal is of course not bound by it; nor is the agent bound by it because the contract does not purport to be with him. What protection has a third person under such circumstances? If the agent knowingly and intentionally exceeds his authority, the third person may hold him in damages for fraud; if the agent innocently exceeds his authority, the third person in some cases may hold him liable in damages for a breach of an implied warranty of authority. Otherwise, the third person deals with an agent at his peril and must assume the risk of the agent's exceeding his authority.

For obvious reasons the agent and the agent alone is responsible to the third person for torts and wrongs committed by him outside the scope of his employment. The principal and the agent are jointly and severally liable for torts and wrongs committed by the agent within the scope of his employment. That is to say, the third person may proceed at his election against them jointly or he may proceed against either or both of them separately. Needless to say, however, the third person is entitled to only one satisfaction in respect to the injury even though the law gives him three causes of action.

The relation of principal and agent may be terminated in one of several ways. The relation is the result of an agreement of the parties to it and may always be changed or terminated by a subsequent agreement of the parties regardless of the content of their original understanding. An agency created for a definite time terminates upon the expiration of that time; an agency for a specific object comes to an end upon the accomplishment of the object. A gratuitous agency may be terminated by either the principal or the agent at will. An agency, even when it arises out of a contract, may be terminated by the act of either party: The principal may revoke the agent's authority or the agent may renounce his agency. In either event, however, the act terminating the relation is a wrongful act, a breach of contract, for which the injured party is entitled to recover damages.

The relation is generally cut short by the death or the insanity of either the principal or the agent. The relation is similarly affected by the bankruptcy of either principal or agent as to matters involved in the bankruptcy proceedings.

5. ORDINARY PARTNERSHIPS, SPECIAL PARTNERSHIPS, AND MINING PARTNERSHIPS

A[1]

Relations which will subject the parties to the liabilities of partners are easily formed. The mere representation that they are partners, or their passive acquiescence in such representations by others, will, as to third parties, suffice to establish partnership liabilities. To form a partnership as between the parties themselves is less simple, requiring the following essential elements: (1) a contract; (2) parties competent to contract; (3) partnership capital or property; (4) a community of control; (5) a lawful business; (6) profit-sharing as a motive.

In addition to the essential elements or features already enumerated, or as a consequence of them, the partnership relation is characterized by certain distinctive features.

1. Each partner is an agent for the others in the transaction of anything within the scope of the partnership purposes. Hence, any contract relating to the proper business of the firm entered into on its account by any one of the partners is binding on the firm.

2. Each partner shares either equally, or in agreed proportion, in the net profits of the business and usually in the losses also.

3. In case of insolvency each partner is personally liable for all of the firm's obligations. This is the most onerous feature of the partnership relation.

4. The property, the business, firm name, good-will, and any trade-marks or other intangible possessions are firm property and form part of the common fund.

5. The partnership relation is a purely personal one and is terminated by the assignment of an interest, or the death or retirement of a partner. A new member cannot be introduced into a firm unless by agreement of all the partners, and then the resulting association, though under the old name, is a new partnership.

[1] Adapted by permission from Thomas Conyngton, *Partnership Relations*, pp. 13–14, 16–18, 20, 21, 22. (The Ronald Press Company, 1905.)

6. A partner is entitled to good faith and fair dealing from his associates, and on dissolution may have an accounting to ascertain his interests in the business.

7. Unlike a corporation, the partnership has no entity distinct from its membership. It cannot sue or be sued in the firm name. It cannot contract with or bring suit against its members, nor can they bring suit against it.

A special partnership is formed for the transaction of some single piece of business, or for the conduct of some one line of business. It is sometimes termed a particular partnership. A partnership to buy and sell some definite piece of land, to ship a cargo to some particular place, to buy and operate a threshing machine, to deal in specified stocks, or to finance and sell a particular patent are all examples of special partnerships. A common form in the present day is the syndicate organized for the promotion or financing of some large corporate enterprise.

The special partnership is distinguished from the general partnership solely by its more limited purpose. The authority of the partners in a special partnership is confined to its specific undertaking, and third persons dealing with it are expected to exercise more care in ascertaining the identity of the partners and the limits of their authority than when dealing with a general partnership. Beyond this, the distinction between general and special partnerships is of little importance, as the same rules govern both.

Mining partnerships form a class to themselves. The United States Supreme Court said: "Mining partnerships, as distinct associations with different rights and liabilities attaching to their members from those attaching to members of ordinary trading partnerships, exist in all mining communities." Under a mining partnership the co-owners of a mine may work it together as partners in the profits only, the mine or mines being owned in common, but not held to be partnership property. This allows any owner to sell his share and introduce a new member without dissolving the partnership. Neither does the death or the insolvency of a partner affect the partnership. As any member may at any time transfer his share and bring in a new associate, there is no relation of trust and confidence between them, and the partners have no right to bind their fellows by contract.

The actual mining under a partnership of this kind is usually conducted by a superintendent or managing partner appointed by

the mining partners or associates. But even though a managing partner be in charge, his power to bind the partnership by contract is very limited. He can only make valid contracts for such supplies and labor as are actually necessary to the transaction of the business, and he cannot give a note binding the partnership unless authority to do so has by usage or express grant been given him.

An ordinary general partnership may be formed for working a mine, but as a rule mines are operated under mining partnerships.

Associations that are not partnerships.—1. Associations not formed for profit are not partnerships. The numerous unincorporated clubs, churches, societies, associations, and fraternal organizations are not partnerships and do not involve mutual agency nor partnership liability. They are governed, moreover, by entirely different rules from those regulating partnerships.

2. In some states, business organizations designated as partnership associations are authorized. These are neither partnerships nor corporations, though they partake of the characteristics of both.

3. Statutory joint stock companies have many of the features of the partnership. They have, however, transferable stock, so that the death of a member or the sale of his interest does not affect the organization; also they are authorized to sue and be sued in a single collective name, or in the name of one or more of the officers, and if a board of managers exists, the individual members cannot contract for the company. These peculiarities differentiate such companies from partnerships.

4. Corporations differ in most of their fundamental features from partnerships. A stockholder in a corporation has no authority to contract; is not in most states liable for anything more than the due payment for his shares; the relation is not personal, and neither his death, his insolvency, nor the assignment of his interest affects the corporation. Also the corporation itself has an entity apart from its stockholders, and sues and is sued in its corporate name. More than this, it can sue its members and they can bring suit against it, without interfering with their membership relations.

5. The law does not imply a partnership from common ownership of either chattels or land. Co-ownership, or tenancy in common, does not therefore involve any partnership between the co-owners. One co-owner could readily sell his interest, his death would not interfere with the relation, nor would he have authority to bind the others by a contract relating to the common property.

Joint tenancy, in the few cases where it exists, is also entirely different from partnership, involving but few of the features of this latter relation. The right of survivorship which marks joint tenancy has no place in the law of partnership.

6. Contracts are very frequently made for a share of profits as compensation for services, for the use of property, or for the loan of money. This does not necessarily form a partnership. In some cases of this kind, however, it is difficult to draw the line and determine the status of the parties.

B[1]

A partnership may terminate in one of three different ways: by force of some agreement of the partners; by a wrongful act of a member of the firm; and by operation of law.

A true partnership is always the result of an agreement between the partners. It accordingly follows that a firm may at any time be dissolved by a subsequent agreement of the partners regardless of the time originally set for the continuance of the relation. A partnership created for a specific object terminates upon the accomplishment of that object; and a firm created for a definite time ceases upon the expiration of the time agreed upon. A partnership at will, as its name implies, is terminable at the pleasure of any member. In all of the foregoing instances, the relation comes to an end by force of some agreement of the parties.

It is usually said that a partnership for a fixed period or for the accomplishment of a specific object can be prematurely terminated by a breach of the partnership agreement on the part of a partner. Such a breach is, of course, a wrongful act for which the injured partner is entitled to recover damages from the wrong-doer. Some courts, however, deny this and hold that a partnership for a fixed period or for a specific object is not terminable merely by the wrongful act of one of the partners.

In certain cases a partnership is terminated by operation of law without regard to the consent or will of the partners. The relation is cut short by the death of any one of the partners. It would be contrary to the theory of a partnership, that each partner has the right to choose his co-partners, to hold that the personal representative of the deceased partner succeeds to his membership in the firm; and if the surviving partners continue the business, the relation is

[1] By W. H. Spencer.

a new partnership and not the old one. Bankruptcy proceedings deprive a person of further control over his property and affairs and vest the control in a trustee. Accordingly, the partnership relation is terminated by the bankruptcy of any member or of the firm.

6. AN EXAMPLE OF ORDINARY PARTNERSHIP ARTICLES

James E. Smith and John Doe, both of the city of Chicago, Illinois, hereby mutually agree to become partners under the firm name of "Smith & Doe" to conduct the trade and business of printing in the said city for the period of five years from date.

The said Smith invests his stock of presses, paper, ink, and other material, estimated to be worth ten thousand dollars, and the said Doe invests ten thousand dollars in cash.

Both partners shall give their entire time and shall share losses and gains equally.

All amounts earned or received by either partner for work, materials, or anything pertaining to the business, shall be deposited in the First National Bank of Chicago in the name of both partners, and shall be checked out as needed for expenses and supplies, by the signatures of both partners, and an equal amount shall be drawn each Monday morning for each partner for personal expenses, but a balance of five hundred dollars will always be kept and held.

When the firm shall be dissolved the balance on hand shall be divided equally and all debts shall be paid from the money in bank, after which the money shall be divided equally between the partners.

Witness our hands and seals this 25th day of October, 1911.

JAMES E. SMITH. [L. S.]

Attest: JOHN DOE. [L. S.]

CHARLES ROBINSON

7. LIMITED PARTNERSHIPS AND PARTNERSHIP ASSOCIATIONS[1]

[The reader should observe that statute law is called upon to make these associations possible. Third persons must have their "due notice" of limitation of liability.]

[1] Adapted by permission from Scott Rowley, *The Modern Law of Partnership*, II, 1370–76. (The Bobbs-Merrill Company, 1916.)

A *limited partnership* is a partnership in which the liability of some of its members to bear any losses the partnership may sustain is limited to a defined amount, while the liability of its other members is not so limited. It must at all times consist of at least one general partner to be answerable to the public under the law for all the obligations of the partnership and at least one partner whose liability is limited to the sum contributed by him to the firm at its organization or to some amount provided by the statute. It is therefore properly based only on the existence of a general partnership and its general partners have the same rights and incur the same liability that members of a general partnership incur, but their duties are even more burdensome since they are deprived of any assistance from the limited members. The liability of a limited partner is generally limited by the statute to the amount he has contributed to the partnership at its formation. However, in some states his liability is fixed by statute otherwise. It is a kind of a union of capital and labor, as expressed by the Supreme Court of Connecticut in construing the limited-partnership statute, in which the court said: "We find a clear general purpose and intent by the legislature to encourage trade by authorizing and permitting a capitalist to put his money into a partnership with general partners possessed of skill and business character only, without becoming a general partner or hazarding anything in the business except the capital originally subscribed." The limited or special members of such a partnership are generally prohibited by the statute from participating in the conduct of the firm's business and by violating such prohibition they become liable to third persons, as general partners, while in a general partnership each member has an equal voice in the conduct of the partnership business.

Such partnerships in some respects partake of the nature of corporations; they can only exist where authorized by statute and the liability of some of their members is limited like the hability of stockholders in some kinds of corporations; their business is to be conducted by the general partners, while the business of a corporation is to be conducted by its board of directors. But this distinction must always be kept in mind: the directors of a corporation are selected by the stockholders and may be changed by such stockholders, while the general partners in a limited partnership are not selected by the limited members nor can they be changed by them. A corporation is an artificial person and constitutes a legal entity,

and its stockholders may transfer their stock, while a limited partnership, aside from its members, does not become a legal entity and generally its members may not change except upon dissolution and reorganization under the statute.

[There is no need of detailed discussion of the so-called *partnership association.* Its fundamental difference from the "limited partnership" is that in the "association" all the partners have limited liability. It is apparent that this is possible only by giving "public notice" to third parties and that accordingly a statute will be passed setting forth the conditions under which such "associations" may operate.]

8. AN ENGLISH VIEW OF THEIR LIMITED PARTNERSHIP ACT[1]

Generally speaking, the principle of limited partnership may serve a useful purpose in any business where—

1. Some only of the members of the firm wish to limit their liability.

2. One or more partners are content to leave the management of the business of the firm in the hands of one or more general or managing partners, and

3. There are good reasons against converting the business into, or forming a private company.

Many cases occur in practice in business and professional circles in which the foregoing conditions will be found to exist. What is often needed in such cases is a form of association between the ordinary partnership and the limited company, and this form is to be found in the limited partnership created by the Act.

Business and professional men.—To deal first with business firms. It may be taken that, with the advance and expansion of commercial enterprise, three objects have emerged of supreme importance to the business community: unfettered facilities for the employment of capital, effective provisions for its security, and protection against unlimited liability. These objects have been achieved to a great extent by the passing of the Companies' Acts, but there are many instances where it is inadvisable to turn a business into a private company with limited liability. The publicity so involved may be a very real objection, or, again, the nature of the

[1] Adapted by permission from "Limited Partnerships," *The Solicitors' Journal and Weekly Reporter*, LVIII (1913–14), 574–75, 591.

business may be such that it cannot be conducted by a company, or that it depends upon the unlimited personal responsibility of those engaged in it. In many cases to limit the liability of a firm would be seriously to affect its credit. When an increase of capital is desired under such circumstances, it can be obtained in two ways, by loan, or by the introduction of a limited partner. But if a loan is chosen it must be very carefully arranged, otherwise the lender may find himself unexpectedly in the position of a full partner with unlimited liability. If, on the other hand, a limited partner is brought in, his liability will be limited to his contribution, while he will still have the advantage of sharing in the profits of the firm. The managing partners will obtain the necessary capital, without having surrendered any part of the control or management of the business. Moreover, the difficulty of publicity will be overcome, for the firm name will remain the same; the name of the limited partner need not form a part of the bill-heads or advertisements, nor need the word "Limited" be added. The articles of partnership wil' be as secret as before; private arrangements between the partners will not be disclosed; and, what is perhaps even more important, the amount of the capital subscribed by the general partners will not become public property.

What has been said with regard to business men applies also to professional men, such as medical practitioners, solicitors, stock-brokers, and so on.

Small traders.—The advantages offered by the Act to small traders are equally obvious, and the register shows that a very large proportion of limited partnerships have been registered by this class. Here again the Act is useful in affording to a trader a simple and inexpensive means of obtaining additional capital without converting his business into a company.

In addition to those already referred to, there are many other circumstances in which the limited partnership principle has been adopted with advantage. The following instances may be quoted.

Sleeping partners.—A sleeping partner is in a somewhat precarious position, since his liability is unlimited though he exercises no control over the business. The Act provides him with an easy way of limiting his liability.

Retiring partners.—It frequently happens that a senior partner, who wishes to retire from active management, is quite willing to allow some, or all, of his capital to remain in the business. He

will thus be saved the inconvenience and anxiety of having to find an investment for his capital, and will be able to retire without crippling the business by withdrawing his money, and without rendering it necessary to find a new partner.

Relatives of deceased partners.—The same considerations apply to these as to retiring partners. Instead of withdrawing the share of the deceased partner from the business, or leaving it in and converting the concern into a limited company those entitled to the deceased partner's share can now become limited partners themselves. The articles of partnership should contain a clause making this possible.

Amalgamation.—The following is another example of a useful purpose to which the Act may be and has been put. A, the owner of a business, is anxious to retire; he is approached by B and C, the owners of another business, with a view to a purchase. Instead of a sale, an amalgamation is arranged, and A becomes a limited partner in the amalgamated concern. His good-will, fixtures, stock-in-trade, book debts, and other assets are then credited in the books as his contribution to the capital. This is made possible by the provision of the Act that a limited partner may contribute "property valued at a stated amount."

Co-partnership.—Perhaps the most important section of the Act and the one which, if generally utilized, may prove of the greatest benefit to the community at large is section 4. This section provides that a "body corporate" may be a limited partnes.

9. DEFINITION AND GENERAL NATURE OF JOINT STOCK COMPANIES[1]

[The student should notice that in many jurisdictions these companies, also, are regulated by statute, although "the association is based upon the common law right of the members to contract with one another."]

A joint stock company may be defined as an unincorporated and voluntary association formed for the purpose of profit, having a common name, possessing a common capital contributed by the persons composing it, which capital is divided or agreed to be divided into shares of which each member possesses one or more, and which

[1] Adapted by permission from Scott Rowley, *The Modern Law of Partnership*, II, 1417–20. (Bobbs-Merrill Company, 1916.)

represent the interests of the members, and are transferable by the owner without the express consent of the other members or the creditors of the association. "Joint stock companies may be cited as quasi corporations of a private character. They are associations having some of the features of an ordinary common-law copartnership, and some of the features of a private corporation." Those definitions in which a joint stock company is denominated a partnership, contemplate the individual liability to third persons imposed by the law upon the members of the association, rather than the nature of the company in respect to its formation, the management of its affairs, its duration and dissolution which are among its distinctive characteristics.

From the preceding definitions we may deduce the following observations concerning the general nature of joint stock companies.

(*a*) Such a company owes its existence to the contracts of its members as set forth in the articles of association by virtue of which it has a valid legal entity under the common law, with a right to extend its existence as the parties forming it may see fit to provide in such agreement. But as hereinafter shown they are largely regulated by statute in many jurisdictions. The real character of the association must in each case be determined by the laws and the articles of agreement under which it is formed, and courts reading such articles in the light of conditions existing at the time they were made will, as far as possible, give effect to the same among the members themselves when they themselves only are interested, and for the purpose of determining the fiduciary relations existing between the association and its members, the association itself through all the changes in its membership, may be regarded at least in equity, as an ideal separate entity involving and possessing equitable rights and relations.

(*b*) Since the association is based solely upon the common-law right of the members to contract with each other, there seems to be no reason why they may not legally do all the things they usually undertake to do, nor why the courts may not apply to them the same principles which permit parties to agree upon such forms of association as they may choose and hold these terms to be binding upon all who agree to them expressly or impliedly, but upon no other persons. As between themselves, therefore, each member of an unincorporated association, after all the assets of the company are exhausted, is bound to pay his proportion of the debts of the concern; but as to

the creditors each member is liable for all such debts, no matter what the private arrangements among the members may be. They might stipulate with each other in the articles of association that they shall not be responsible other than out of joint funds, yet as to the rest of the world it is clear that each is liable to the whole amount of debts contracted, nor can this liability be shifted except by a transfer of shares in the exact mode prescribed by the articles of association.

(*c*) The association has a common name, which is usually descriptive of the business for which it is formed and does not consist of the names of persons. In this name it may enter into contracts in the manner prescribed by the articles of association, and may generally sue and be sued under that name.

(*d*) The capital of the company is divided into shares, and the number of shares held by each member determines his interest and the extent of his control of the management, and as between the members themselves fixes his proportion of liability for debts of the association. Ordinarily these shares represent a certain amount of money, or the value of property transferred to the company by the shareholders.

(*e*) The shares are transferable at the will of the owner, or at his death become assets of the estate in the hands of his personal representative. That the shares are transferable is evidence of the intent that such death or transfer shall not result in the dissolution of the company and gives it the quality of perpetual succession. The transfer of shares must be made in conformity with the articles of association, for by these the shareholders have themselves provided the means by which their interests, rights, and liabilities in the company may be made to devolve upon others and to these they must be held.

10. SOME RESULTS OF INCORPORATION[1]

A corporation, it appears, then, is an association of persons.

But there are other associations of persons for business purposes —partnerships, syndicates, and other associations resting merely on contract. If any of these associations take the benefit of this joint-stock corporation law, they become corporations. What do they gain by it? In other words—and the putting of this question as really the fundamental one, greatly clarifies the subject—what is incorporation? What is it, and of what advantage is it, to become

[1] Adapted by permission from Thomas Thacher, "Incorporation," in *Yale Law Journal*, IX (1899–1900), 85–88.

a body corporate or corporation? Suppose that a number of persons have come together to form an association for business, and the question is raised whether or not they shall file their articles and become incorporated. Will they have any broader powers as to the business they may do? Certainly not. They can engage in any lawful business, unincorporated. Incorporated, they can do nothing more. If they desire to be able to change the business upon the agreement of less than all the associates, the articles can so provide. As to the business they may do, they rather assume a restraint than gain a greater freedom, by incorporation. And they subject themselves to the burden of making reports about their business to state officials. They do not by incorporation acquire the right to use a larger capital in their business, and as to the issue of shares and the getting of additional capital in the future, the articles may provide as fully, and perhaps with less restrictions, if the association is to remain unincorporated. The statute contains convenient provisions as to organization and management, which are carried into the articles without being expressed, if the articles are filed. But like provisions may be expressed in the articles with but little more trouble, if the association is to rest on agreement merely. Speaking generally, the association, if not incorporated, may have as broad powers, as large a capital and as much freedom of action, as if it becomes a corporation. Indeed it is under less restraint and, if its associates are of one mind, it is practically unlimited, as an individual is, as to what it may do or what it may own. Its power for good or evil as an influence in the line of business in which it operates is quite as great.

By becoming a body corporate, the association gets simply the right to be regarded, in its legal relations, as though it were a being separate from those who compose it. That is the meaning of the phrase as determined by the usages of the past. Call it an independent entity, if you please, or a legal person. The idea is graphically set forth by these names; and the names are of value in its application. Incorporation creates the right to be regarded as a separate being. The association is an association of persons after incorporation as before. The associates and their successors, that is, in a stock corporation, the stockholders, associated together, under the articles, are the corporation. But in the relations of the association with the individual stockholders and with all outsiders, it is, when incorporated, to be dealt with and regarded as an independent body.

And from this come two results: first, that the death of the associates or the transfer of their interests does not affect the existence of the corporation; and, second, that the individual stockholders are not chargeable with the acts or omissions of the corporation, are not liable for its debts or obligations or for the wrongs which it commits, except so far as the statute may expressly provide. The first of these results is, in many cases, the sufficient inducement to incorporation, because of the convenience of having a business so organized that many can participate in its profits, that interests may be divided and sold or bequeathed without disturbing the business itself. All this may, it is believed, be accomplished by agreement. Witness the unincorporated joint-stock companies engaged in the express business. But the statutes have been carefully worked out; and if there is any omission it can be supplied by further legislation; and so it is much more convenient to reach these ends by incorporation than by agreement merely. Still, that the same continuity of the association, the same transferability of interests could be accomplished by agreement merely, is not to be forgotten when legislation is proposed, based upon what the corporation gets from the state. But what cannot be got by agreement is the irresponsibility of the associates or stockholders for the acts or omissions of the association. Theoretically, perhaps, this might be deemed possible, because all who should have dealings with the association might conceivably so agree. But practically, it is impossible to secure this result save by the action of the state. This, then, is the chief thing which the state confers by incorporation, freedom from personal liability, or, in some cases, limitation of personal liability, for the debts and wrongs for which the association is responsible. This is common to corporations of all kinds, and is peculiar to corporations. And there is nothing else of which this can be said.

A few applications of what has been said to the suggestion made at the outset seem appropriate.

Since freedom from, or limitation of, the personal liability of the associates is the only thing common to all corporations and peculiar to them, and it comes by grant from the state, this is the chief basis of the right and the propriety of legislative regulation of the management of incorporated companies. Authorizing the associates to do business, to invite credits, without the ordinary liability of individuals, the state is bound to concern itself with the management of their capital, which is the sole reliance, or in excep-

tional cases, the chief reliance, of creditors. The propriety of statutory regulations looking to good management cannot be doubted, and good management means management intelligent, effective, and honest.

Out of the common provision that the affairs of corporations shall be managed by a board of directors comes a legitimate basis for regulation of management in the interest of stockholders. Stockholders, as a rule, have no voice in the management save to determine by their vote at fixed periods who the directors shall be, and to make by-laws. The power to make by-laws does not permit the general management to be taken out of the hands of the board, in which it is vested by law. Hence, in matters of regulation looking to good management—management intelligent, effective, and honest—it is proper that the Legislature should consider not only the interests of outsiders who are or may become creditors, but also the interests of stockholders.

In the interest of creditors or those who may become such, provisions requiring reports to be made, revealing the financial condition of corporations, find legitimate basis; but intelligent legislation of this kind will require no further publicity than the purpose requires. The interests of stockholders require only private reports to them. And as to those who may think of purchasing stock, it is doubtful whether they may not best be left to the rule of *caveat emptor*, with the additional protection as to stocks dealt in on the exchanges of the regulations which such exchanges may adopt, and with, perhaps, more stringent enactments as to misleading statements in prospectuses and the like, whether issued by corporations or not. The stock of many corporations changes hands but rarely. They are private institutions, and except for the protection of creditors, there would seem to be no reason why they should be required to make their affairs public.

Statutory provisions operating upon all corporations are not justified by reasons relating to such franchises as the franchise of operating a railroad. Legislation based upon such reasons should be limited to the particular class of corporations holding such franchises.

11. HISTORICAL STAGES IN THE CORPORATION[1]

Having regard to their creation, there have been three principal eras of private corporations. During the first period they were

[1] Adapted by permission from W. F. McCook, "Suggestions on the Organization of Corporations," in *Yale Law Journal*, IV (1894–95), 169–72.

created by royal prerogative. These franchises were generally granted as royal favors. They were more or less related to the administration of public affairs or the increase of the material interests of the home government or its colonies. The purpose of their creation was largely to extend the political power or increase the revenues of the Crown. The essential characteristics of such corporations were only two, perpetuity and exclusive rights. The directors or managers constituted the corporation. Stockholders, as the term is now used, were then unknown. Their existence was not contemplated in the deed or grant of incorporation. Their rights, duties, and liabilities were not defined. They were shareholders only in the limited sense that they had the right to share the profits earned by the stockholders or managers. The foundation of this right lay in contract only. Their relation to the directors was that of trustees and *cestui qui* trust. As a general rule they could not even select their own directors, the right to fill vacancies in that body being vested in the remaining members of the board.

The second period is that in which, both in this country and in England, corporations were created by legislative enactment. Each corporation was created by a separate enactment. The most general plan of creation was to constitute certain persons named as incorporators or commissioners, authorizing them to receive subscriptions for the capital to be applied to the undertaking named in the enactment. When a given amount of capital was thus subscribed they were directed to call the subscribers together, and the latter perfected their organization by electing their officers and directors and defining their respective duties by by-laws adopted by them. Thus the stockholders have come prominently into view. Their power in the organization and management of the corporation is increased; that of the directors is diminished and defined. The stockholders select the directors, define their duties, and limit the duration and scope of their offices.

The public was not as yet quite prepared for the idea that he, for whose benefit the common undertaking is carried on and who derives all the resulting profits therefrom, should enjoy absolute immunity from the common law liability of joint undertakers. Therefore a conservative compromise between general, individual liability on the one hand and entire immunity from the claims of creditors on the other, was hit upon, and it was generally provided that the individual liability of the stockholder for the debts of the

corporation should bear a limited, fixed relation to the amount of stock held by him. This liability has been defined to be secondary, the creditor being first required to pursue the corporation to the extent of its assets. This idea is preserved in our national bank statutes, whereby the stockholder is made individually liable in an amount equal to the stock held by him. It is in most of the charters of our state banks, and in some states it applies to all private corporations. The prominent characteristics of corporations of this era, as contrasted with the preceding one are perpetuity, power of the stockholders over the management of the company, and limited liability of the stockholders.

As these corporations were created by an act of the legislative body, politics often dominated its action both in granting and withholding franchises. Strong lobbies grew up at our capitals, whose business it was to procure valuable franchises and sell them to others. The more liberal the scope of the charter, the greater the immunity of the stockholder, the more valuable the franchise was to sell. So broad and unlimited became the scope of these franchises that they were properly called "omnibus" charters. One such might be instanced under which a steamship line was operated on the Atlantic seaboard; it was next used as the contractor to construct an interstate railway in the Southwest; now it is used to supply a large city with gas. Naturally this nefarious traffic in public franchises worked its own destruction; took from our legislature the power to grant franchises, and produced the third era of corporate creation which may be called the "free corporation era."

England has not entered into this era as completely as our states have. There the right still resides in Parliament to create certain corporations, such as railway companies. In all of the states of our Union and as to almost all kinds of corporations, the right to become a corporation is free to any of its citizens voluntarily associating themselves together for such purpose.

The evident purpose sought to be secured by these free corporation statutes was to encourage opposition in manufacture and commerce and to prevent monopoly. With few exceptions, there is no liability on the part of the stockholders beyond paying for the stock for which they have subscribed. This done, the company can borrow money, increase its liabilities to any extent it can procure credit, run itself into hopeless bankruptcy, and the stockholders enjoy absolute immunity from the claims of creditors.

Looking at the present condition of the markets for our corporate securities, we may see that the striking characteristics of the corporations of our third era are protection to the stockholder, risk to the creditor. The reason for this is not hard to find when we consider the manner in which many of our corporate enterprises have been organized.

12. FORM OF CORPORATION CHARTER

We, the undersigned, in order to form a corporation for the purposes hereinafter set forth, under and pursuant to the provisions of the Act of the Legislature of the State of New Jersey, entitled "An Act Concerning Corporations (Revision of 1896)," and the acts amendatory thereof and supplemental thereto, do hereby certify as follows:

ARTICLE I

The name of the corporation is:

ARTICLE II

The principal and registered office of the Company is in the Building , New Jersey, and the name of the agent therein and in charge thereof, and upon whom process against this corporation may be served, is

ARTICLE III

The objects for which and for each of which the corporation is formed are:[1]

It is the intention that the objects, purposes, and powers specified in the clauses contained in this third paragraph shall, except where otherwise expressed in said paragraph, be nowise limited or restricted by reference to or inference from the terms of any other clause of this or any other paragraph in this charter, but that the objects, purposes, and powers specified in each of the clauses of this paragraph shall be regarded as independent objects, purposes, and powers.

ARTICLE IV

The following provisions for the regulation of the business and the conduct of the affairs of the Company are hereby established:

[1] This "object clause" varies with the nature of the business. Ordinarily it is comparatively simple, but it may be made very broad and comprehensive, as in the case of the U.S. Steel Corporation, given in the following selection.

The corporation may use and apply its surplus earnings or accumulated profits authorized by law to be reserved to the purchase or acquisition of property, and to the purchase or acquisition of its own capital stock from time to time, to such extent and in such manner and upon such terms as its Board of Directors shall determine; and neither the property nor the capital stock so purchased and acquired, nor any of its capital stock taken in payment or satisfaction of any debt due to the corporation, shall be regarded as profits for the purposes of declaration or payment of dividends, unless otherwise determined by a majority of the Board of Directors or a majority of the stockholders.

The corporation in its by-laws may prescribe the number necessary to constitute a quorum of the Board of Directors, which number may be less than a majority of the whole number.

The Board of Directors shall have power, without the assent or vote of the stockholders, to make, alter, rescind, or amend the by-laws of the corporation, to fix the amount to be reserved as working capital, to authorize and cause to be executed mortgages and liens upon the real and personal property of the corporation; and from time to time to sell, assign, transfer, or otherwise dispose of any or all of the property of the corporation, but no such sale of all the property shall be made except pursuant to the vote of at least two-thirds of the Board of Directors.

The Board of Directors from time to time shall determine whether and to what extent, and at what times and places, and under what conditions and regulations, the accounts and books of the corporation, or any of them, shall be open to the inspection of the stockholders; and no stockholder shall have any right of inspecting any account or book or document of the corporation, except as conferred by statute or authorized by the Board of Directors, or by a resolution of the stockholders.

The Board of Directors shall have power to hold its meetings, to have one or more offices, and to keep the books of the corporation (except the stock and transfer books) outside of the State of New Jersey at such places as may be from time to time designated by them.

ARTICLE V

The Company shall be authorized to issue capital stock to the amount of dollars. The number of shares of which the capital

stock shall consist is shares of the par value of dollars each. (If preferred stock is desired, insert provisions therefor at this point.)

ARTICLE VI

The names and post-office addresses of the incorporators, and the number of shares of stock for which severally and respectively we do hereby subscribe, the aggregate of our said subscriptions being dollars, which is the amount of capital stock with which the Company will begin business, are as follows:

Names	Post-Office Addresses	No. of Shares

ARTICLE VII

The duration of the Company shall be perpetual.

In Witness Whereof, we have hereunto set our hands and seals this day of 191

[L.S.]
[L.S.]
[L.S.]

13. A CHARTER OBJECT CLAUSE[1]

III. The objects for which the corporation are formed are:

To manufacture iron, steel, manganese, coke, copper, lumber, and other material, and all or any articles consisting, or partly consisting, of iron, steel, copper, wood, or other materials, and all or any products thereof.

To acquire, own, lease, occupy, use, or develop any lands containing coal or iron, manganese, stone, or other ores, or oil, and any wood lands, or other lands for any purpose of the company.

To mine or otherwise to extract or remove coal, ores, stone, and other minerals, and timber from any lands owned, acquired, leased, or occupied by the company, or from any other lands.

To buy and sell, or otherwise to deal or to traffic in iron, steel, manganese, copper, stone, ores, coal, coke, wood, lumber, and other materials, and any of the products thereof, and any articles consisting or partly consisting thereof.

To construct bridges, buildings, machinery, ships, boats, engines, cars, and other equipment, railroads, docks, slips, elevators, waterworks, gas works, and electric works, viaducts, aqueducts, canals,

[1] From the charter of the United States Steel Corporation.

and other water-ways, and other means of transportation, and to sell the same or otherwise to dispose thereof, or to maintain and operate the same except that the company shall not maintain or operate any railroad or canal in the state of New Jersey.

To apply for, obtain, register, purchase, lease, or otherwise to acquire, and to hold, use, own, operate, and introduce, and to sell, assign, or otherwise to dispose of, any trade-marks, trade-names, patents, inventions, improvements, and processes used in connection with or secured under letters patent of the United States, or elsewhere or otherwise, and to use, exercise, develop, grant licenses in respect of, or otherwise to turn to account any such trade-marks, patents, licenses, processes, and the like, or any such property or rights.

To engage in any other manufacturing, mining, construction, or transportation business of any kind or character whatsoever, and to that end to acquire, hold, own, and dispose of any and all property, assets, stocks, bonds, and rights of any and every kind, but not to engage in any business hereunder which shall require the exercise of the right of eminent domain within the state of New Jersey.

To acquire by purchase, subscription, or otherwise, and to hold or to dispose of stocks, bonds, or any other obligations of any corporation formed for, or then or theretofore engaged in or pursuing any, one or more of the kinds of business, purposes, objects, or operations above indicated, or owning or holding any property of any kind herein mentioned, or of any corporation owning or holding the stocks or the obligations of any such corporation.

To hold for investment, or otherwise to use, sell, or dispose of, any stock, bonds, or other obligations of any such other corporation; to aid in any manner any corporation whose stock, bonds, or other obligations are held or in any manner guaranteed by the company, and to do any other acts or things for the preservation, protection, improvement, or enhancement of the value of any such stock, bonds, or other obligations, or to do any acts or things designed for any such purpose; and while owner of any such stock, bonds, or other obligations, to exercise all the rights, powers, and privileges of ownership thereof, and to exercise any and all voting power thereon.

The business or purpose of the company is from time to time to do any one or more of the acts and things herein set forth; and it may conduct its business in other states, and in territories, and in foreign countries, and may have one office, or more than one

office, and keep the books of the company outside of the state of New Jersey, except as otherwise may be provided by law; and may hold, purchase, mortgage, and convey real and personal property, either in or out of the state of New Jersey.

See also p. 434. Corporate Securities Viewed as Instrumentalities.
p. 440. A Classification of Stocks.
p. 448. A Classification of Bonds.
p. 450. Recitals in Bonds.
p. 456. Policies Concerning the Kind and Amount of Securities.

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14. THE POWERS OF STOCKHOLDERS[1]

A. OF THE POWER OF THE INDIVIDUAL STOCKHOLDER, AND OF THE STOCKHOLDERS ACTING INDIVIDUALLY

Of the individual.—It is a fundamental principle of the partnership that each member is in all matters within the apparent and legitimate scope of the partnership business the general agent of his co-partners, and the firm and all its members are liable for whatever is done by him in transacting the business of the partnership in the ordinary way. The position of the stockholder of a corporation is entirely different. He is neither the agent of the corporation nor of its members, nor are his acts or contracts as an individual binding on either, though made with reference to the affairs of the corporation and for its benefit.

The reasons for this difference in the powers of the members of a corporation and that of a partnership are to be found in a comparison of the natures of the two organizations. The partnership can in no sense be viewed as having an existence apart from that of its members. Its liabilities are their liabilities. They, in short, are the partnership. The corporation, on the other hand, while it, like the partnership, is made up of individuals, is an entity entirely distinct from the members that compose it. It is a legal person, endowed with powers that belong in no wise to its corporators, and which cannot be exercised by them. Its liabilities are not the liabilities

[1] Adapted by permission from W. L. Kitchel, "The Power of Stockholders to Bind a Corporation," in *Yale Law Journal*, V (1895–96), 84–92.

of its members, except to the limited extent to which they have by their subscription assumed them. It follows then that a stockholder, acting not in a corporate capacity, should have no more power to control this separate and distinct individuality than should any other person. Nor does the fact that his interests are bound up in that entity give him this power, for by his contract of membership he has surrendered his control, except in so far as by his vote he participates in corporate matters.

A second reason for the wider power of the partner as compared with that of the stockholders is derived, not theoretically, but from the practical working of the two associations. The partnership is made up of comparatively few persons, who have united in a common enterprise with a full knowledge of one another and with confidence and reliance each in the other. Not so in the case of the corporation, which from its origin contemplates a membership more or less numerous and composed of individuals whose very existence may be unknown to the others. It stands to reason, therefore, that in his contract of membership the stockholder has intended to confer upon his fellows no such powers as does the partner on entering into the partnership.

Of stockholders acting individually.—The principle having thus been established that the individual stockholders cannot bind the corporation, it necessarily follows that any number of the stockholders acting individually can have no greater power in this respect. And when carried to its extreme it is a necessary consequence of this rule that stockholders owning a majority or even all the stock of the company cannot control the corporation, except when acting duly in their capacity as members of the corporation. This applies also with equal force to a single member who himself represents a majority or even all the stock.

Illustrations.—In conformity with these rules it has been held that a stockholder has no authority to release a debt due the corporation; that individual members cannot transfer the corporate property. Nor can they even, although holding a majority of all the stock, make a valid lease or sale of such property. Nor can they mortgage the same. Shareholders, when not acting as a corporation, cannot convey lands of the corporation, though all join in the deed. The owner of all the capital stock of a corporation does not become thereby the legal owner of its property, and cannot maintain replevin for it in his own name.

B. OF THE POWER OF A MAJORITY

Its extent.—In considering the power of a majority it will be found that it is similar in both corporations and partnerships. In the charter on the one hand and in the partnership agreement on the other are laid down in greater or less detail the general purposes and ends of the organization. In becoming a member both the stockholder and partner impliedly agree that in all that is necessary or incidental to the attainment of these purposes the majority shall have supreme authority and may bind the association. The necessity of implying such an agreement is evident when it is considered that if there were no such understanding it would be possible for one dissenting member to prevent the transaction of any business whatsoever, however thoroughly it might be included within the purposes of the association.

Its limit.—From the fact that this power of the majority rests wholly upon the original contract of the members, be it a charter or a partnership agreement, it follows that in both classes of organization it must be limited in its extent by the scope of that same contract. To adopt any other view would be to hold that the dissentient stockholder would be compelled to resort to one of two courses of action, both equally unjust. On the one hand he could remain a member of the corporation and be bound by the act of the majority, thereby being made a party to an obligation which in entering into the corporation he had never contemplated assuming, which he had never agreed expressly or impliedly to assume, and which by his dissent he had even refused to assume. That such a case is extremely unjust is palpable, and the other alternative is equally oppressive. All that would remain for such a stockholder would be to withdraw from the corporation. In this way a majority could absolutely control the organization, and the existence of such a power, susceptible to so great abuses and so conducive to corruption, would open the way to the greatest injustice. Hence, we drive the general principle that *a majority of the stockholders can bind the corporation in all matters within the scope of the corporate purposes and in such matters only.*

In applying this general rule it will be found that the classes of cases which come under its control are several, and it will be necessary briefly to examine these in order.

By-laws.—In the first place, to facilitate the attainment of the corporate purposes it is essential that a system of by-laws should be adopted, regulating the government and business methods of the

company. In so far as they are reasonable and tend to effect these purposes, by-laws adopted by the majority are binding on the corporation, and their right to make them rests on the implied agreement of the shareholders in forming the company. But any such rules, inconsistent with the original agreement which is the fundamental rule of the company, or which are injurious to the interests of the concern, or are unreasonable or contrary to the general principles of the law, it is, in accordance with our rule, beyond the power of the majority to thrust upon the corporation.

Appointment of agents.—As it is necessary that in its business transactions the corporation should be represented by agents, it is impliedly agreed in the charter contract that such agents should be appointed. Hence, their appointment being within the limits of the charter powers, it is also, in accordance with our rule, impliedly agreed that the majority may select and confer authority upon such agents as may be necessary, and their choice in this matter will bind the company.

Ratification.—Not only may the majority bind the corporation by its own acts within the limits laid down in the general doctrine, but it may also exert the same power by way of a ratification of unauthorized acts of its agents. Hence it follows that an act of an agent outside of the scope of his authority may by vote of the majority be made binding upon the corporation. But it also follows that this power of ratification has the same limitations as the primary power of the majority and hence no act of an agent which is beyond the limits of the charter can be made effective.

Alteration of charter.—To materially alter the terms of the charter is clearly an act which is beyond the purpose of the charter agreement, unless therein otherwise stipulated. Hence our rule would prevent the acceptance of such alteration by a majority.

Transfer of all corporate property.—To sell out all the property and privileges of a corporation is an act which is consistent with the purposes of its charter, when it is made necessary by the condition of the concern, as where the business has become unprofitable, and hence, it is within the powers of the majority to bind the corporation by a sale under such circumstances. But a transfer effected by them while the affairs of the concern are prosperous, whether for a purpose beneficial to the stockholders or not, is invalid, and at the suit of a stockholder an injunction will be granted to prevent such transfer, and if it has already been completed it will be declared void and an accounting will be decreed.

Restrictions on general rule.—Although, as is seen from the cases already reviewed, the doctrine as stated has been thoroughly established, still in the greater number of corporations the power of the majority will be found to be actually much more strictly confined, in most cases extending only to a general oversight of the affairs of the company and to the appointment of its agents, while all other matters are delegated to the agents thus appointed. This limitation, however, can be easily reconciled with the general rule, for it will be found that, wherever such a restriction exists, it is invariably provided for by the express terms of the charter itself, which, as we have seen, must be in all cases the ultimate criterion of the powers of the majority.

C. POWER OF STOCKHOLDERS ACTING UNANIMOUSLY

Having thus disposed of the power of the individual stockholder and of the majority, there remains the final division of our subject—the power of the stockholders acting unanimously. An act of all the members *in their corporate capacity* is an act of the corporation itself. Hence this division of our subject embraces simply the question as to the power of the corporation to bind itself. It is no longer a matter of the power of the stockholders, but involves the whole doctrine as to the so-called *ultra vires* acts. A discussion of this theory is entirely beyond the scope of this article. Suffice it to say that the rule applying to a majority does not extend to the action of the whole membership. While no mere majority, however large, may transcend the limits laid down by the charter, it is otherwise with the stockholders acting unanimously, for many of their contracts and actions will be sustained, even though entirely without the scope of the charter purposes. It is readily seen why such acts should be binding in so far as they are not nullified by the intervention of other principles of law. The charter was created and existed only by the unanimous agreement of the stockholders. Hence it may be altered or entirely repudiated by any subsequent unanimous agreement on their part, and as among themselves they will be bound by any action in pursuance of such an agreement, however alien it may be to the terms of the original charter. But it is just at this point that the general principles of the law and of public policy intervene and determine which of these acts shall be deemed valid and which of no effect. The rules governing this determination can be ascertained only from a study of the doctrine of *ultra vires* powers.

It is no doubt true that for a complete discussion of the subject originally undertaken an examination into the doctrine of *ultra vires* would be necessary. But so extensive is this doctrine, and the results dependent upon it, that it should more fitly be treated as a matter entirely independent of the subject in hand.

15. LIABILITY OF CORPORATE DIRECTORS

A[1]

It should be noted that only those powers which are given by the corporate charter, whether expressly or by implication, can be exercised by the board of directors, or by the vote of the directors and shareholders combined. Anything done beyond such powers is *ultra vires*, and subjects the corporation to an action by the state to forfeit its charter.

It is the purpose of the paper to point out some of the duties and to indicate some of the liabilities attaching to corporate management. It is important, first, to determine what the legal relationship is between a corporation and its directors. Are they trustees in the strict meaning of that word or in any sense in which the law defines that word? Or are they merely agents appointed by and acting for the corporation in its business transactions?

There is a great difference, both in the duties and the liabilities of trustees and agents. A trustee is said to be one to whom property has been conveyed to be held or managed for another. While he acts for another's benefit he has large discretion and is usually independent from control by the legal owner of the property. The power and the equitable estate are vested in him for the purpose of controlling the subject-matter of the trust. This authority does not come from the beneficiary but is to be found in the trust instrument and in the law relating to it.

On the other hand, an agent is one who by the authority and on behalf of some other person undertakes to do some act or transact some business for another. He is at all times under the control of such other person relating to the affair in which he is acting. He has no title or interest in the property involved and his agency is terminable at any time by his principal. He is directed and controlled by his principal and is not clothed with discretion in the

[1] Adapted by permission from W. P. Rogers, "Corporations," *Chicago Legal News*, XLVII (1914–15), 382–84.

matter, unless it is specially given by his principal. His duties and liabilities are, therefore, much more limited than are those of a trustee.

A director of a corporation holds a position somewhat similar both to that of a trustee and an agent and yet in many ways different from either. He has neither legal nor equitable title to the property. This remains in the corporation. He manages it for the corporation, although in the conduct of its affairs he receives little or no authority or instruction from the corporation. These he finds in the laws relating to his position.

It is true he may ask advice of the stockholders relating even to the ordinary affairs of the corporation but he is under no obligation to do so. Concerning these, his position gives him power to act. But in a few extraordinary matters such as disposing of all the corporation's property, increasing the capital stock, or amending the corporate charter, the law usually requires some action of the stockholders preliminary to final action by the board of directors.

There are many cases in which the question whether directors are trustees or only agents has been discussed, and the better conclusion seems to be that they are agents but invested with large discretionary powers, and that they hold a fiduciary relation to the corporation and its shareholders. Because his powers are so ample, the law imposes upon the director the duty of diligence toward his trust, which must always be exercised in the interest of the beneficiary and never in his own behalf. It also holds him responsible for losses resulting from negligence or mismanagement of the property, by rules much more stringent than are applied to an agent.

In accepting the office, directors impliedly contract to give to the corporate management their best judgment and such diligence in the duties connected with it as may reasonably be required. They cannot be relieved from liability on account of their imprudent management by reason of their ignorance or lack of experience or their honest purposes. They undertake, by assuming the office, to give to the business whatever time and attention may be required of them in properly managing the interests intrusted to them.

If they act with reasonable care, skill, and diligence, but nevertheless commit an error of judgment or make a mistake of some character from which financial loss results to the corporation, they will not be held personally liable.

Directors must not be negligent in conducting the corporation's business. They must act in good faith. It is sometimes said that they must act with as much care toward the corporation's business as an ordinary prudent man takes in the management of his own affairs. But this rule has been much criticized and is evidently too stringent. If one as director is required to give to corporate business the same diligence which a prudent man gives to his own affairs, practically all the director's time would be thus occupied and he could not be diligent with his own affairs. The weight of judicial opinion is that directors are liable only for losses traceable to their own wrongs or gross neglect of their duties.

That directors are liable in an action at law to their principal, the corporation, for losses resulting to it from malfeasance, misfeasance, or their failure or neglect to discharge the duties imposed by their office, and in equity, to the stockholders for these losses (the corporation declining to bring suit) is clear, upon the authorities. Though the corporation is the legal entity, yet the stockholders are interested in the operations of the corporation while in a state of activity and, upon its dissolution, in the distribution of its property, after all debts are paid, and so its officers or agents stand in a fiduciary relation to both. But it is otherwise as to creditors. The directors of a going corporation, whether able to pay its debts or not, owe no allegiance to them. It is true that the creditors may extend credit upon the faith that the company has assets to pay its debts, and that these assets are prudently managed; yet they are strangers to the directors; they maintain no fiduciary relation with them; there is a lack of privity between the two.

Of course the Legislature may by statute change this common law rule, and there are many statutes which have modified it. These statutes are so different in the various states that they cannot here be enumerated.

Directors are held responsible to the corporation or to its shareholders for losses sustained by reason of their *ultra vires* acts.

Directors' services for their corporations are presumed to be voluntary and without expectation of pay. It is supposed that compensation to directors comes in profits from the business in the form of dividends on their stock. Directors, therefore, are not legally entitled to compensation for official services rendered by them unless the same has been provided for by the charter or the by-laws of the corporation.

Their position not infrequently presents tempting opportunities for directors to personally profit in transactions for their corporation. But the law will not permit a director thus to secure secret profits. Should he do so, the corporation upon discovering this fact may either rescind the transaction or require him to account to it for any such profits. It is a breach of trust for a director to accept a gift from one who is contracting with the corporation. He may be required to turn over to the corporation all such gifts, bribes or secret profits. Should the corporation refuse to bring an action against the guilty director, it may be instituted by a shareholder.

B[1]

What might be called the amateur aspect of a directorship has probably increased greatly during recent years. By this is meant the idea that such a position is an avocation, a luxury, a compliment paid to a successful business or professional man, something like the bestowal of an honorary degree. And amid the great variety of other considerations that prevail, many have little or nothing to do with the management of the company's affairs. For example, one is elected because a relative is a large stockholder and would be pleased. Another bears an honored or conspicuous name which would look well upon statements. A third has large interests and is rather expected to "bring business." It is tacitly understood that none of these men will be called upon to contribute much of his time.

It must be observed, in the first place, that there has been no relaxation as far as the statute books are concerned in the theory that directors are to exercise an active, if not continuous, control over the policy of a company. Many of the theoretical safeguards, however, have become either dead letters or the merest farce. For example, the provision that directors must be stockholders has become so atrophied that the phrase "qualifying shares" is employed frankly as though it were wholly legitimate and did not signify in its very origin a defiance of the spirit of the provision. For qualifying shares, as is well known, are merely those which are entered on the books of the company in the names of the several directors who have no stock but are desired as members of the board. So, although the title remains in the company itself, they become stockholders as far as the records are concerned, and everyone is satisfied.

Two very obvious lines exist along which reforms might proceed. One is to recognize the maxim that everybody's business is nobody's

[1] Taken by permission from Frederick Dwight, "Liability of Corporate Directors," *Yale Law Journal*, XVII (1907–8), 33–42.

business, and that as long as boards consist of numerous members with vaguely defined responsibilities very few will feel any serious sense of personal liability and will be inclined to attend to their duties only so far as it is convenient for them to do so. This proposition is emphasized by the modern rise of executive committees in importance —representing a logical if unconscious trend toward a concentration of responsibility—or perhaps, more properly, a realization of the difficulty of assembling a numerous body of busy men in a practically volunteer capacity at intervals of such frequency as to render their meetings very serviceable.

The executive committee is merely an inner circle of the board composed usually of those directors who are most accessible, most interested in the operations of the corporation, and most familiar with them. It bears the same relation to the full board that an ordinary agent does to his principal, and in general its acts are those of the board. In many companies, indeed, its existence has reduced the directors practically to the level of a ratifying body whose services might easily be discarded.

But the other very simple, if not wholly effectual, remedy would be to define sharply and apply vigorously the penalties which lie ready for indolent directors.

The lesson to be gathered from the cases seems to be that, although courts adjure directors to be good and to give some heed to the companies they have honored with their "assistance," at the present time they are not required to be familiar with the operations of the company (*Wakeman* v. *Dalley*), they need not attend meetings of the board if inconvenient to do so (*Briggs* v. *Spaulding*), they are not responsible for the misconduct of executive officers appointed by themselves (*Wheeler* v. *Aiken Co. Bank*) unless, indeed, the wrongdoing is so palpable that it is practically forced upon their attention (*Gibbons* v. *Anderson*), and if they persuade two or three of their number to do all the work, the latter alone will be held responsible for a neglect of such duties (*Warren* v. *Pennoyer*). Where else in human affairs may be found so admirable a combination of distinction without anxiety, of reward without toil? Would it not be well for the corporations and society at large if penalties that are admitted to be proper in the abstract were insisted upon until the prodigious number of pseudo-directors who are now in evidence were "squeezed out," and a really hard-working director, as distinguished from an officer, became less of an anomaly than he seems under present conditions?

16. THE DISSOLUTION OF A CORPORATION[1]

Unless otherwise provided by statute, a private corporation may be dissolved only in five ways:

(*a*) By the weight of authority, by expiration of its charter.

(*b*) By an act of the Legislature repealing its charter, under the power of repeal reserved by the state in granting the charter.

(*c*) By the loss of an essential integral part, which cannot be supplied; as by death or withdrawal of all the members, where there are no means of supplying their places; but this does not apply to modern stock corporations.

(*d*) By surrender of its charter with the consent of the state.

(*e*) By forfeiture of its charter for misuser or nonuser of its powers. But

(1) A forefeiture only takes effect upon the judgment of a competent court ascertaining and decreeing a forfeiture, unless the Legislature has clearly provided otherwise.

(2) Where the acts or omissions of which the corporation has been guilty are, by statute, expressly made a cause of forfeiture, the court has no discretion to refuse a judgment of forfeiture. But in other cases the court has a discretion to determine from the circumstances whether judgment of ouster of the franchise to be a corporation shall be rendered, or whether the corporation shall be merely ousted from the exercise of the powers illegally assumed.

(3) The Legislature, as the representative of the state, may waive the right to insist upon a cause of forfeiture, as by acts recognizing the right of a body to continue as a corporation. But, to constitute a waiver, the acts must be inconsistent with the intention to insist upon a forfeiture.

(4) The forfeiture must be enforced by the state, by its authorized representatives. It cannot be enforced or insisted upon by private individuals, either collaterally or directly.

(5) A forfeiture may be enforced by *scire facias* where there is a legal existing body, capable of acting, but who have abused their power; or by an information in the nature of *quo warranto* where the body is merely a corporation *de facto*, or where it is neither a corporation *de facto* nor *de jure*. The procedure is now generally fixed by statute.

[1] Taken by permission from W. L. Clark, Jr., *Handbook of the Law of Private Corporations*, pp. 291–92. (West Publishing Company, 1916.)

17. SOME METHODS OF CONCENTRATION OF CONTROL[1]

[No attempt is made to give a full treatment of the various methods of concentration of control. The following selection gives an excellent summary of the field.]

Thus far we have examined organizations which may be called simple associations. In each of the forms discussed in the foregoing pages, the individual has been the constituent unit, and, in each case, the individuals as units have been simply and directly associated. Formally, at least, the natural persons who are the members have stood in an immediate relation to the direction of the management of the organization. The highest and most efficient form of organization by simple association is the corporation.

Looking around us today, what do we see? On all sides we behold complex organizations which indirectly, through subordinate and simpler forms, deal with markets which are sometimes world-wide in extent. Of course, independent simple associations, such as partnerships and uncombined corporations, continue to exist, just as the single-individual organization does; and, moreover, combinations were not unknown in earlier times; but a substantially accurate idea of the evolution of business organization will be gained if one thinks of a new cycle of development as opening about the time of the Civil War, or say 1870, and reaching a climax about 1898—a cycle in which the constituent units more and more frequently became associations of individuals, and the resultant organizations were compound affairs or combinations. It may be said that artificial persons (corporations) more and more form the units of the later associations. For over a generation we have been growing more and more familiar with the rich terminology of combination. The columns of the press bristle with "combines," "trusts," "associations," "pools," "consolidations," "rings," "mergers," and what not.

Few readers, or writers either, for that matter, discriminate carefully among the terms which indicate the various forms of combination; but there are as many different kinds of combinations as there are kinds of simple association, and in dealing with these different kinds it will be found conducive to clear thought to apply the various terms according to their logical denotation and best usage.

To combine is simply to become one of the parts of a whole, and a combination is merely a union of persons to make a whole or group

[1] Adapted by permission from L. H. Haney, *Business Organization and Combination*, pp. 128–32. (The Macmillan Company, 1914.)

for the prosecution of some common purpose. The idea of purpose is not separable from the meaning of the word as used to indicate unions or men, for men hardly unite without a common object in view; and it is significant that even the dictionaries use the word "confederacy" in defining human combinations. Aside from the idea of purpose, however, the word "combination" is properly used as the most general and colorless term to denote any sort of union of persons, and will generally be so used in the following pages. The law, with which we are constantly touching hands in this subject, recognizes two classes of persons, the natural and the artificial, or corporate; and generally, in present-day business, persons of the latter kind are the ones which are directly concerned in the formation of combinations. Indeed it would be well if the word "association" could be used to indicate direct unions of individuals or natural persons, for that word implies a personal relation, a linking together in fellowship, which is not found in the combination of artificial persons. This is, perhaps, a refinement which cannot now be insisted upon, but it has been observed in these pages. When the term combination is used alone it will mean a compound combination, or combination of associations.

Next, the idea of "federation" should be brought in. Federation is alliance for mutual support, or a union by agreement of independent and autonomous powers for mutual benefit in relations external to any one member, and it implies that outside of such external relations the members retain their independence and autonomy. Thus a federation, both in political and business life, is a relatively loose form of combination based upon mutual consent.

Another general term is "consolidation." Consolidation, by the logic of words and by best usage, applies only to firm, compact alliances. It should, therefore, never be applied to federated organizations, but only to combinations in which the members are so compactly united as to lose a large measure of independent and autonomous existence. They are fused. For example, both the Southern Wholesale Grocers' Association and the United States Steel Corporation are combinations, but the former is a federation organization while the latter is a consolidation. The law recognizes the distinction between consolidation and mere combination, for the validity of consolidations, involving as they do a greater loss of individuality on the part of their members, depends upon statutory authority and not upon public policy; whereas combinations other than consolidations

have their validity determined by public policy, and the laws rarely authorize but often forbid them.

A "merger," as the term clearly indicates, is a form of organization in which the identity of the parts is lost. The members are absorbed, as it were, into a common whole, and the merger is thus a complete and absolute consolidation. Though the term is loosely used, there is considerable legal authority for confining "merger" to consolidations in which one business organization absorbs another or others and continues to exist, as when a railway system absorbs a branch line. In view of this fact, it is logical to use another term, "amalgamation," to indicate a consolidation in which all the combining organizations give up their identities, become fused, and coalesce in a new organization.

An outline classification of combinations, then, would run somewhat as the following:—

I. Simple Combinations:

1. Association (direct combination of natural persons as in partnerships).

II. Compound Combinations:

1. Association (the loosest agreements directly between individual members of different associations: trade "associations," some simple "agreements," etc.).
2. Federation (combination of organizations which remain separate and retain considerable autonomy: most simple "agreements" and pools).
3. Consolidation (combination of organizations in which, while members may retain nominally separate, direction of business is fused).
   a. Partial Consolidation:
      (1) Securities holding (direction of business organizations consolidated through stock ownership, with separate existence formally maintained).
   b. Complete consolidation:
      (1) *Merger* (complete consolidation, members of one business organization absorbed by another).
      (2) *Amalgamation* (complete consolidation, members of two or more organizations coalesce to form a new organization).

See also p. 671. Elimination by Combination of Risks.
p. 553. Technological Industry Is Frequently Large Scale Industry.

18. SIMPLE BUSINESS TRUSTS[1]

When the word "trust" is mentioned, most men at once think of some illegal combination. The term is in bad odor. Yet if one were to inquire of a lawyer concerning trusts one would probably be told that they are very desirable social institutions, and that they are perfectly legal. Moreover, in the conservative state of Massachusetts, one could find scores of harmless business organizations which are carried on under the trust form. Whence comes this seeming paradox?

The trusts thought of by the layman are the "standard oil trust," the "sugar trust," and the like. These are all more or less monopolistic combinations of corporations. The lawyer, however, has in mind the general idea of the trust institution, which is a very different matter. While trusts may be readily perverted when used for combinations, they are necessary and beneficial in many other relations. The lawyer may be thinking of the trustees appointed by the courts to administer the estates of deceased persons, infants, etc. Also, in some states, trustees are chosen to carry on businesses for groups of individuals, and to supervise investments. Such uses of the trust institution need involve no monopoly; and they need combine no corporations.

The simple business trust is a form of business organization under which the legal title to property is vested in an individual trustee or individual trustees. (Corporations may act as trustees, as is the case with trust companies. In such cases, the trust is the function; the organization is a corporation.) The property is managed by them in the interest of the former title holders who become "beneficiaries" (*cestuis que trustent*). The trustees thus become, not agents—as are partners—but principals; and they can make contracts, and can sue and be sued in their own names. The beneficiaries, in turn, are neither partners nor agents. They cannot convey the property to others; nor can they usually maintain any action at law for its protection. They only have the right of action against the trustees. With such a relation existing between trustees and beneficiaries, it is apparent that without any special provision to the contrary the debts of the business lie against the trustees, not against the beneficiaries.

Under the common law, trustees may and do issue certificates of beneficial interest, the capital embraced in the trust being divided

[1] Adapted by permission from L. H. Haney, *Business Organization and Combination*, pp. 117–27. (The Macmillan Company, 1914.)

into shares. These certificates are much like the stock certificates of a business corporation.

Lawyers distinguish several classes of trusts: active and passive, simple and special, express and resultant, etc. The terms active and passive are self-explanatory. A "simple" trust is one established without any special instructions to the trustees, thus allowing great discretion on their part. An "express" trust is created by an instrument which designates directly and expressly the property, persons, and purposes of the trust; whereas a resultant trust is one which results from the construction put by the law upon some existing or past relation. Practically all business trusts may be classed as active express trusts; but, as it is next to impossible to define the duties and policies of trustees, they are all virtually "simple" trusts.

From the economic point of view, two classes of trusts are clearly distinguishable: (1) trusts of real estate, and (2) trusts of personal property. Personal property trusts, in turn, are of two kinds: (*a*) industrial trusts for carrying on some manufacturing, mercantile, or other business; and (*b*) securities-holding trusts, organized for investment in or control of corporations or joint-stock associations.

There is a kind of holding trust in existence to-day which, within certain limits, is entirely legal, however undesirable it may be. Such trusts are known as "voting trusts," and are sometimes called "stock pools." The voting trust is a kind of special express trust, which may be defined as a form of organization in which holdings of stock are combined by placing them in the hands of trustees to be voted in a stipulated manner. A voting-trust agreement is entered into; and the stocks are transferred to the trustees and taken out in their names, negotiable trustee receipts being given by them in exchange. They are authorized to collect dividends, and are bound to pay such dividends over to the holders of the trust receipts. Unified voting is the object in voting trusts, and the ownership of stocks is not vested in the trustees: they are trusts of management, not of property.

If this form is at hand for organizing business units, and has actually been used in not a few cases, one's next inquiry is: What are its potentialities? Why is it used at all? Why is it not more used? The answer to these questions involves a discussion of the advantages and disadvantages of the simple business trust.

Applying the six tests of efficiency of business organization, we note first that the trust is readily and cheaply formed. It does not

require the sanction of the state. In facility of formation, then, it is on a par with the partnership.

As to capital, the trust lies between the partnership, as ordinarily organized, and the corporation. The trustees issue certificates which accommodate a number of investors; but the character of the management makes it impossible to appeal to so wide a market as do the stocks of a corporation. Furthermore, the trust certificates can be sold or assigned only in states which authorize by statute the assignment of those rights to personal property which are contingent upon suit at law (*choses in action*). In other states the buyer may have to file a bill of equity to get the title.

The liability of the members of trusts is in practice handled very satisfactorily, from the point of view of the investor. It is common to make an agreement that neither the trustees nor the beneficiaries shall be liable for the debts of the trust, which provision is made a part of every contract entered into by the trustees. In a word, it is provided that the trust property alone shall be looked to for the satisfaction of debts. This leaves the beneficiaries in a more desirable state than even the stockholders of a corporation, as there would be no excess of par value of shares over value of property to be drawn upon. Unless some such agreement is made, it appears that the trustees are personally liable: trustees can be held personally for material ordered for a trust estate, and for contracts made.

The foregoing tests, then, are met fairly well. Aside from questions of legality, the crucial test, therefore, comes in the efficiency of direction. Here we find that the *continuity* of management is excellent; for trustees are not likely to be changed. In this the trust has an advantage over the corporation for businesses in which continuity is highly desirable. It also appears that in practice trustees can handle business with more ease and dispatch than the average board of directors. But the case is not so favorable on the important points of *motivation* and *flexibility*. True, the trustee is in equity bound to take such care of the trust estate as he would of his own property. That fact, however, can have but an uncertain and intermittent motive force, and can not adequately take the place of responsibility to shareholders. The beneficiaries have no power to remove trustee managers. They possess no remedy for unskilfulness on the part of trustees; and they can remove trustees who are guilty of fraudulent acts only by means of an uncertain bill in equity. As to *flexibility*, the trust is sadly deficient. The deed

of trust once drawn up and put in force, its provisions are not subject to change except by the unanimous consent of all parties. The courts cannot change the powers of trustees, nor alter the terms of the trust agreement. And a trustee who has accepted a trust can neither renounce the duties and responsibilities of his office, nor delegate them to another. We must conclude that the trust will supply a safe and efficient instrument for direction only in case of businesses which are little subject to change, and which require relatively little discretionary action on the part of the managers. Such a business is the holding and managing of real estate.

A final disadvantage of trusts lies in their doubtful legal status. As a general proposition, at common law, trusts are quite legal: anyone who can enter into a contract, or make a will, or deal with legal title to property, may vest property in trustees. But, of course, this proposition is subject to the limitation set by public policy and by statute law. Trusts for combining corporations may be illegal as being the result of *ultra vires* acts by the corporations. New York and other states forbid trusts of real estate except in certain cases; and some states have abolished all trusts and uses except those which are established by will or deed.

Considered from a social standpoint, the business trust is so liable to abuse, and requires such safeguarding, that it may fairly be called a dangerous institution. It will be remembered that the idea of the trust developed from the need of a suitable agency to manage the estate of incompetent persons, not to conduct businesses for competent persons. While the trust supplies a stable and enduring organization, as used in business, it almost of necessity places in the directors (trustees) a discretion which is out of all proportion to their actual responsibility. It is not a safe form, viewed from the standpoint of society.

19. CO-OPERATIVE INDUSTRY[1]

[The sample of co-operative industry here discussed is taken from agriculture. Of course the principles here treated are of wider application.]

There is much confusion in the use of the term "co-operation" as applied to agricultural efforts. It is commonly applied to any group of farmers who associate themselves together. They may

[1] Adapted by permission from G. H. Powell, *Fundamental Principles of Co-operation in Agriculture*, pp. 1–5, 9–10. (Circular No. 123, California Agricultural Experiment Station, 1914.)

organize as members of a voluntary unincorporated association of individuals; or as an incorporate capital stock association to handle farm crops for profit or for other purposes, or as non-profit corporations without capital stock. It is believed that its use as applied to business organizations in agriculture should be restricted to incorporated associations, societies, exchanges, or agencies which are formed exclusively for the benefit of the members; whose voting power is based on equality of membership; whose membership is confined exclusively to active producers, the membership ceasing to exist when the producer withdraws from the organization, and whose earnings are distributed on the basis of the product, rather than on the capital contributed by each member, after a fair rate of interest is paid for the use of capital actually employed in the business, if any, and other overhead charges are deducted. A co-operative organization, therefore, is not a corporation in which the capital is contributed primarily in order that it may earn a profit; nor one composed of producers and non-producers; nor one in which the producer's product is handled by a corporation for the benefit of the stockholders rather than for that of the members; nor one in which the membership is not under the control of the organization; nor one in which the members do not actually control the organization. It is an association of farmers who unite in an effort to handle their common interests through an agency which is controlled by them, on the principle of an industrial democracy, and exclusively for their benefit.

The stock corporation as defined by the statutes of most states is not the form under which to incorporate a farmers' business organization, though most of the so-called co-operative associations have been incorporated under the stock corporation statutes. The stock corporation laws have been enacted primarily to meet the needs of capital, not primarily for the benefit of those who may use the facilities of the corporation. The membership in such organizations is not under legal control, because the right to sell the stock is a legal incident of its ownership. A stockholder may sell his farm and continue to be a stockholder in a stock corporation and still have the right to examine the affairs of the association, or he may sell his stock to someone who is not interested in the organization, or who may even be antagonistic to it; or he may withdraw his membership and still remain a stockholder. There is no legal way by which the stock, and therefore the control of the corporation, can be confined to the membership after the stock has once been issued, unless the association is able to take over

the stock and hold it as a trustee, until it can be resold to a member. Neither is the voting power of the stockholders under control in a stock corporation, because the voting power is generally proportional to the number of shares held by each stockholder.

As a matter of fact most of the so-called co-operative associations of the country have been incorporated as capital stock corporations in the absence of other statutes under which they could be incorporated and many of them operate by mutual agreement expressed in the articles of incorporation, or in the by-laws, on strictly co-operative principles: others vote in accordance with stock ownership, fix the maximum amount of stock to be owned by any member, and apportion the stock on the bearing acreage of the members, but make no profits on capital. These organizations usually provide that a withdrawing member shall offer his stock to the association before he can sell it outside, a provision that is useless if the association is not able to take it over.

They may provide also that all the earnings shall be returned to the members prorated on the business transacted by each after interest is paid on the capital invested and other overhead charges are deduced. The stockholders may vote equally by agreement and the capital invested may be paid only a fair rate of interest for its use. The difficulty in such organizations lies in the fact that some of the conditions to which they agree are not, in case of trouble, enforceable in the courts, and the organization ceases to be co-operative when the stockholders desire for any reason to exercise their legal privileges along non co-operative lines.

As a result of organizing a so-called co-operative association under the stock corporation laws, many of these organizations often pass into the hands of non-producers or of rival interests, following the withdrawal of members through the sale of farms and the sale and transfer of stock; or a partial control may be held by dissatisfied stockholders who have withdrawn as members.

In other states, especially in California, the statute provides for the incorporation, organization, management, and co-operation of agricultural, non-profit associations which do not have capital stock and whose business is not carried on for profit. These associations issue certificates of membership to each member but the membership cannot be transferred or assigned to any other person, nor is the purchaser of a property of a member entitled to membership by virtue of such purchase. In such associations the basis of voting and the

control of the membership is subject to rules made by the association. These associations may accumulate a capital with which to transact business though the capital is not in the form of a paid-in capital stock. It may be accumulated pro rata from the proceeds of the shipments of the members, or in any other way agreed to by the members.

In Nebraska co-operation has been defined and given a legal status. The law says, "for the purpose of this act, the words 'co-operative company, corporation, or association' are defined to mean a company, corporation or association which authorizes the distribution of its earnings in part or wholly, on the basis of, or in proportion to, the amount of property bought from or sold to members, or of labor performed, or other service rendered to the corporation." It differs from the general incorporation law of Nebraska by providing that every co-operative corporation has the power "to regulate and limit the right of stockholders to transfer their stock; and to make by-laws for the management of its affairs; and to provide for the distribution of its earnings."

In Wisconsin, a law was passed in 1911, which provides for the formation of "a co-operative association society, company, or exchange, for the purpose of conducting agricultural, dairy, mercantile, mining, manufacturing, or mechanical business." The law provides that "no stockholder in any such association shall own shares of a greater par value than one thousand dollars . . . . or be entitled to more than one vote." It provides that the directors shall apportion the earnings, subject to revision by the association at any time, "by first paying dividends on the paid-up capital stock not exceeding 6 per cent per annum, then setting aside not less than 10 per cent of the net profits for a reserve fund until an amount has been accumulated in said reserve fund equal to 30 per cent of the paid-up capital stock, and 5 per cent thereafter for an educational fund to be used in teaching co-operation, and the remainder of said net profits by uniform dividend upon the amount of purchase of shareholders and upon the wages and salaries of employees, and one-half of such uniform dividend to non-shareholders on the amount of their purchases, which may be credited to the account of such non-shareholders on account of capital stock of the association; but in productive associations such as creameries, canneries, elevators, factories, and the like, dividends shall be on raw material delivered instead of on goods purchased. In case the association is both a selling and a producing concern, the

dividends may be on both raw material delivered and on goods purchased by the patrons." The law provides that no corporation or association doing business for profit shall be entitled to the use of the term "co-operative" as part of its corporate or business name unless it has complied with the provisions of the act.

In a strictly co-operative organization a fundamental principle should be "one man, one vote." It should be a real industrial democracy in which the members trust each other and lean upon each other's judgment as men. In such an organization neither the capital contributed, nor the volume of business transacted should be the basis of the responsibility or influence of the individual member, because neither can co-operate or be made a basis for lasting co-operation. In the European co-operative associations the "one man, one vote" principle is applied as a test to separate the true co-operative associations from the pseudo co-operative. Since co-operation is founded on man, not on capital nor on products, there is no fundamental difference in principle where capital is eliminated and product is substituted as the basis of voting and control. The control of a co-operative association should be founded on the equality of membership, whether the member contributes a large or a small volume of business. It is the members who, as men, co-operate in these organizations.

There is a strong sentiment against the "one man, one vote" principle of voting when first presented to the average producer. The large producer fears control by smaller interests; the small landholders, domination by their larger neighbors. The history of the co-operative movement, both in Europe and in the United States, shows clearly that this adverse sentiment is a prejudice rather than an actual weakness in practical operation. Equality of membership strengthens the desire to co-operate, and men work together in business harmony just as they now do in the equal control of churches, schools, and in governmental responsibilities.

REFERENCES FOR FURTHER STUDY

Haney, *Business Organization and Combination.*
Marshall, *Readings in Industrial Society*, pp. 714–79.

CHAPTER IX

BASIC FEATURES OF ADMINISTRATION

Purpose of this chapter:

1. To see what, in general terms, is involved in business administration.

2. To canvass present-day knowledge with respect to sound rules of action in the field of administration.

In our preceding discussions of various business functions we have made it a point to conclude each discussion with a brief consideration of an appropriate way to organize the department at issue. We have now reached a stage in our study where it is worth while to raise the general question of what is involved in administration. We are primarily concerned with business administration, but this general question may well be considered with public administration, school administration, and other possible forms of administration in the background of our thinking.

There has been a quite considerable volume of writing directed at the question, "What are the fundamental 'laws' or 'principles' of administration?" The problem is too new for a conclusive answer. The following, therefore, represents only an approach to the answer.

We have not troubled ourselves greatly in this course over terms and definitions. It is best, however, in the next few pages, to be fairly definite in our use of certain terms. Let us arbitrarily (see pp. 2, 3) use the term administration to include (*a*) policy formation, (*b*) the planning and setting up of the organization, and (*c*) the running of the organization. Let us, furthermore, note that it is something of a misnomer to ask for "principles" or "laws" of administration. *Administration implies action* and it is more appropriate to speak of sound *rules of action* in the field of administration than it is to speak of principles or laws. True enough, these rules of action may depend, for their appropriateness, upon some background scientific laws, as we shall later see. But that is another matter.

We address ourselves, accordingly, to the question, "Can we formulate sound rules of action in the field of business administration?" Frequently a specific problem clarifies issues. Let us assume

that John Jones, mature and able but largely innocent of business knowledge, asks us to tell him how to go about determining what are sound rules of action in this field. As I conceive it, our answer might well run as follows:

I. Any action should be in terms of the phenomena—facts—in which the action is to occur. The first task, therefore, is that of securing *an appreciation of business facts*, or data. We cannot now stop to state the details of the enormous mass of data upon which action is to be taken. We can only point out certain elementary considerations connected with securing acquaintance with the necessary facts.

First of all, remember that classification is an indispensable aid in securing a knowledge of business facts. They are so multitudinous that it is absolutely futile to try to survey them as isolated units. They must be taken in groups. Any grouping which is useful is a good grouping, and the one upon which we have based our study of business data is the functional grouping shown on page 15. Whether one expects to become acquainted with business facts through personal contact or through study of the experiences of others as set forth in printed volumes, he will find this classification an aid to understanding.

But this is the merest beginning. These business facts or phenomena have their roots down deep in basic sciences such as physics, chemistry, the earth sciences, and the social sciences. To cite only one illustration, the business phenomenon of a differential wage system reaches back into such realms of study as psychology, history, and mechanics. There is no end to the amount of study which may be given to business facts if one cares to go below the surface. No one human being could possibly have a deep knowledge of all the basic sciences of business. On the other hand, one who expects to "administer" in the realm of business facts will do well to have a decent understanding of the main principles of the various sciences. In no other way can he really know business facts; in no other way can he administer in terms of fundamental principles as opposed to "rules of thumb." In other words, remember, secondly, that the study of business facts is not merely the simple direct study one might at first thought suppose. One must know these facts in terms of a knowledge of the underlying sciences.

Bear in mind, thirdly, that new as our study of business administration is, we have already reduced many of the relationships of these facts to "standards," and one may wisely be on the alert for these standards. In this course we have seen financial standards,

standards of labor performance, standards of sales and purchase performance, and many others. Admittedly, our present standards are not all good. Some are indifferent. Some are positively bad. If, however, we come to know business facts in terms of the basic sciences we may confidently look forward to a steady and rapid increase of good standards. That is, indeed, the fundamental idea in so-called scientific management.

To summarize, in trying to arrive at good rules of action in business administration one must know business facts, and if one wishes to go far he must know them (*a*) in terms of an appropriate scheme of classification, (*b*) in terms of underlying scientific principles, and (*c*) in terms of standards of performance.

II. All this is merely preliminary to developing rules of action. Let us now assume that we are to lay down rules of action with respect to the administration of some entirely new project. Any project whatever may be chosen as an illustrative case.[1] In any novel project one will not go far astray in laying down the following as an appropriate *chronology of action.*

1. The first thing to do is to get clearly in mind your objective. In most cases this objective should not be visualized or stated in terms so general that action is likely to be diffused and uncertain. It may be that a large objective must be narrowed down or, in some cases, broken into sub-objectives. It goes without saying that an objective can be set only in terms of the facts involved.[2]

2. With the goal or objective, or objectives, in mind an appropriate second step is the selection of the proper road by which to reach the goal. (This may be called either a second step or a part of the first step, as one chooses.) In most cases, there is not one but several roads to a business goal and a phase of policy formation is the definite decision to use a certain road, or roads, to the exclusion of others.[3]

[1] The setting up a school of business in an established university may perhaps be kept in mind as an illustrative case, since the students will know the main facts reasonably well and there is an advantage in discussing a case where all have much the same background of factual knowledge.

[2] To follow out the illustration suggested, the objective "setting up a school of business" is too vague, It must be reduced to more specific terms. Is this school of business to prepare people to be managers and administrators or to be clerks? Is it to train only in terms of money-making or also in terms of social service? It will be noticed that the determination of both objective and sub-objectives is a phase of policy formation.

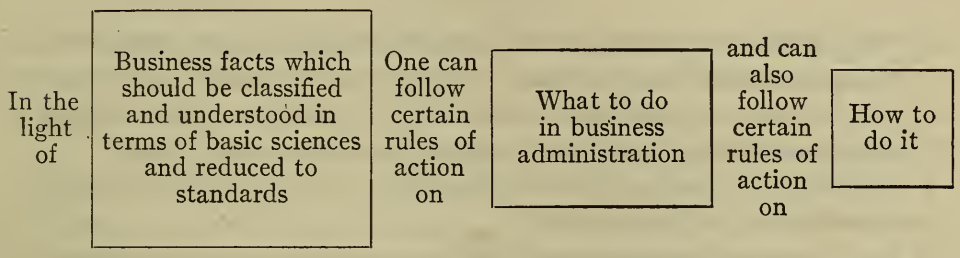
[3] Again following out the suggested illustration, once the objective is clearly defined to be, let us say, that of preparing for administration, what parts are to be played by field work, discussion method of instruction, lectures, etc.? Again,

3. Having selected the route (routes) which shall be used to arrive at the determined goal (goals), the next series of steps to be taken in an enterprise of even moderate size is: (*a*) Plan the organization and control system which are to be used, and (*b*) instal them. Both these steps must be in terms of the facts at issue (see pp. 778–88).

4. Operate the organization you now have.

III. A review of the last few paragraphs will show that they have been concerned with *what* to do. No rules of action have been suggested concerning *how* to do it. For these rules you are referred to Selection 5. (Pages 813–23.)

The foregoing may all be summed up in diagrammatic form thus:



It is a point having some significance that such an outlook on rules of action in business administration is likely to cause one to reject the commonly accepted dictum that it is not possible to train for the higher reaches of business administration involved in policy formation. There seems to be no reason why, as our knowledge of business facts in terms of the basic sciences grows and our awareness of what is involved in forming business judgment increases, we may not progress in our training for policy formation. No doubt it is a hard task and no doubt our knowledge will develop slowly, but there seems to be no good reason for regarding that field as forbidden ground. Quite the contrary.

The readings in this chapter are arranged in accordance with the following plan: The first selection discusses the mental aspects of administration and shows the technique of forming a business judgment. Selection 2 points out that there is no single, unvarying, correct form of organization but that the organization must be in

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in securing a competent faculty, choice is to be made between, for example, slow development of young men or selecting mature men at high salaries from the teaching or business worlds. It will be noticed that we still have questions involving policy but we are now also getting over into the realm where an organization is being planned. Final decision on all these points should be in terms of the facts of the particular case.

terms of the facts of the particular case. Selection 3 reviews some of the current utterances on the essential components of organization and management, and Selection 4 shows the more outstanding types of organization. One might, perhaps, call them *standards* in the field of organization. Selection 5 is a "how" selection (worthy of very careful study) which in some sense summarizes the "how" features of all the preceding selections. Selection 6 reminds us again of some of the forms of the measuring and communicating aids which are at the disposal of the administrator. The chapter closes with a glimpse of what is involved in the industrial leadership of today.

PROBLEMS

1. "The problem of management consists in the practical application of two great intellectual processes: analysis and synthesis." Be sure you can explain what the writer has in mind. Are, then, the principles of management simply the principles of any sound mental effort?
2. It is said that synthesis precedes analysis. Does it not follow analysis? Can the two be independent?
3. In the realm of business administration, what is the function of instinct? memory? habit? reason?
4. Assume that you are "up against a blank wall" in some problem. Outline a good technique of handling this situation.
5. What conditions determine fertility of suggestion in the solution of a business problem? How do you account for the fact that occasionally someone who has been regarded as quite mediocre "suddenly" becomes a first-class person?
6. What is the function of the associative process in business administration?
7. Defend the position that training for business should include courses whose bearing on "business" seems very indirect.
8. Take some problem and, by introspection, see if you follow the steps indicated on pages 768–78.
9. "We shall never be able to reduce policy formation to a set of rules. We can do little in the way of formal training in this field." Do you agree?
10. Lough says that the basic managerial traits are:

    a) Health, *b*) Energy — chiefly physical
    c) Observation, *d*) Concentration, *e*) Judgment — chiefly mental
    f) Confidence, *g*) Ambition — chiefly affective

h) Persistence
i) Reliability } chiefly volitional
j) Control

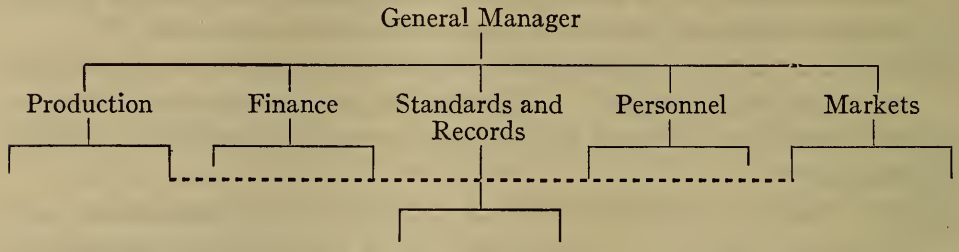
Would you modify this statement? Does it contradict the material in this chapter?

11. "All organizations will differ somewhat from one another, because the objects, the results that are sought, and the way these results must be obtained are different; and, moreover, the material out of which the organization is made, differs in kind." What does this mean? If true, how can organization be profitably studied?
12. Define or explain: (*a*) continuous analytical industry, (*b*) assembling or intermittent or interrupted industry. In which is the control problem more difficult?
13. How should you organize the following enterprises: (*a*) the removal of the snow from the streets of Chicago after a heavy storm; (*b*) to obtain information for the government concerning industrial conditions in various plants working for the government, and report in three weeks; (*c*) same as (*b*) but given six months for the investigation?
14. Draw up a list of reasons against the idea that there is one universal, correct form of organization. Do the reasons convince you?
15. "Thus we know pretty definitely the factors that make for organization. They are structure, lines of authority, responsibility, division of labor, system, discipline, accounting records and statistics, *esprit de corps;* but when we attempt to determine the parts played by these factors, we find that their relative importance changes with the purpose, conditions, and materials." Is this a statement of principles of organizations? If not, what is it?
16. Jones lists as administrative principles (1) the measurement of authority; (2) division of functions; (3) choice of persons; (4) co-ordination; (5) co-operation; (6) the systems of orders; (7) the system of reports; (8) information; (9) promotion; (10) the normal incentive; (11) administration and human nature. What do you think these are?
17. Emerson says there are twelve principles of efficiency "so constant, so true, that they may be used as gauges" of the efficiency of "any industry, any establishment, any operation," viz.: (1) ideals; (2) common sense and judgment; (3) competent counsel; (4) discipline; (5) the fair deal; (6) reliable, immediate, and accurate records; (7) planning and dispatching; (8) standards and schedules; (9) standardized conditions; (10) standardized operations; (11) written standard practice instructions; (12) efficiency reward. What do you think these are?
18. "Management is teaching." What idea is this quotation trying to express?

19. "The most important problem is that of getting the right man for the head of the company. And if you have the right man, the choice of the type of management may safely be left to him." Does this dispose of the question whether there are principles of management?
20. "We are wasting a lot of time talking about organization and the like. There is nothing to organization but leadership. What we need to study is the psychology of leadership." Do you agree?
21. "Organization and system are something forced on us by the necessities of the case. They have no virtues in themselves. They add nothing to leadership, but if poor, they may detract from leadership." Explain. Do you agree?
22. "Just as the manager needs good organization and standards for routine, so he needs a broad background and philosophy with which to meet emergencies." How can a manager prepare for these emergencies?
23. "The science of organization insists that lines of authority and lines of communication shall be carefully outlined." What does this mean?
24. "Along with responsibility must go commensurate power or authority." Do you agree? If so, is this a "law of management"?
25. "The sum and substance of control in a large plant is contained in this statement: We should have centralization in policy making and decentralization in execution." Comment.
26. "There are two elements in the control of work—desirability of exercising foresight, and the necessity for preserving flexibility—which are antagonistic." Can they be reconciled? If so, how?
27. What types of industry or undertakings are apt to find the military type of organization the best? Which are apt to find the functional type the best form?
28. "The vital defect in modern organizations of business, particularly of the military type, is the foreman system." What does this mean?
29. "The functions of staff and of line are not antagonistic; they are not rival and alternative types of organization." Do you agree?
30. "If there is any one leading lesson in the Unit System for the average manager of an industrial establishment, it is the insistence on the psychological value in every man signing his name for what he is individually responsible, and nothing more." Explain.
31. If you wish to pick out one idea as the dominant one, what would that idea be in the case of line organization? staff organization? committee system? Taylor scheme? Which scheme is most in line with the human analogy cited on page 808?
32. Place the organization of the following activities in terms of the various forms of organization which have appeared in the preceding questions: (*a*) a baseball team; (*b*) the work of a university; (*c*) the work of a church; (*d*) an intercollegiate debate.

33. "How is one to draw up an organization scheme? My answer is that he must break up his problem into its component parts and then must organize to solve it on the simple basis of opportunism—doing what he can as he can." Do you agree? If you accept this position are you forced to conclude there are no principles of management?
34. "The mechanism of management must not be mistaken for its essential, or underlying philosophy. Precisely the same mechanism will in one case produce disastrous results, and in another beneficial." Why, or why not?
35. Are Taylor's functional foremen a principle of management or a technical device or an illustration of some principle of management or something else?
36. "The regulative principles of the art of management are three: (*a*) the systematic use of experience; (*b*) the economic control of effort; (*c*) the promotion of personal effectiveness." Does this cover all the points raised in questions 15, 16, and 17?
37. What is the relationship between accounting and statistics? between standards and records?
38. How do you account for the great development which has taken place in the field of business analysis in the last generation?
39. "It is evidently more economical to produce each month about the same quantities than to run at a forced rate for one or two months and then drop below normal." How does the budget help to bring this about?
40. "As a matter of fact, a definite and binding budget, which can be debated and settled by all the responsible officials and directors of a company at the beginning of a fiscal year, is a highly effective method of securing the unity of purpose which is an essential factor in every efficient organization." Explain.
41. "Budgets should be both annual and monthly." Explain why this would be advantageous.
42. "The departmental budgets are especially valuable in holding department heads to given standards." Just how?
43. Answer the objection to budget-making that a particular business will fluctuate widely with business conditions and will not run in a uniform channel.
44. "Budgeting may be all right for a large business but it is a waste of time for a small one. It is even worse, in that it tends to prevent prompt action." Do you agree?
45. "The diversification of industry and the constantly increasing necessity of depending upon indirect supervision and management together with rapidly changing business conditions necessitates the use of scientifically prepared forecasts." Why? How may these forecasts be prepared?

46. Regard the following organization chart as designed merely to raise the question of how to organize to care for standards and records (see pp. 757–58) in business. The dotted line shows liaison connections.



What does the chart imply with respect to the handling of standards and records? What is the implication of the use of the word "standards"? Would this department handle the budget?

47. "The measuring aids of business management." Put content into the expression.
48. "The handmaidens of the new administration." Explain.
49. "The business manager is being transformed from a mere owner of private property into a responsible agent, exercising delegated authority." Explain.
50. "The whole situation conspires to create an opportunity for a new race of executives which shall justly appreciate the various classes of responsibility resting upon it." Put content into the phrases (*a*) "the whole situation"; (*b*) "classes for responsibility."
51. "A new and larger conception of the function of business leadership is called for." Explain.
52. An investigation was made recently into the promotional advancement of many hundreds of business executives. In the case of higher executives they seem quite as likely to have been taken over from some other very different line of industry as to have come up through the one they are now managing. Do you think this is typical? If typical is it fortunate or unfortunate? What bearing has your answer on training for management?
53. How do you account for the fact that good administrators are ordinarily highly paid men?

1. THE MENTAL ASPECTS OF ADMINISTRATION

A. MANAGEMENT AND ITS TWO GREAT INSTRUMENTS[1]

In any industrial undertaking there are two elements present, which, though sometimes merging into each other, and always exerting reciprocal influence, are nevertheless quite distinct in their

[1] Adapted by permission from A. H. Church, *The Science and Practice of Management*, pp. 1–25. (The Engineering Magazine Company, 1914.)

essence. The first of these is the determinative element, which settles the manufacturing policy of the business—what to make—and the distributive policy—where to sell and by what means. The second is the management element, which takes the policy as determined and gives it practical expression in buying, making, and selling.

Of these two elements, which are not infrequently combined in small businesses, the first—the determinative—represents the higher and scarcer faculty. The larger the business, the more difficult will it be to obtain men capable of adequately filling the exacting demands for judgment, foresight, courage, and experience which decision on large points of policy sets up. The danger in vast organizations commonly lies, not in any prospective failure on the side of the management element, for in this department the assistance of all kinds of experts can be obtained; errors, moreover, are of less vital consequence, and their results can be more quickly reduced to safe proportions. It is failure in the determinative element that pulls down flourishing businesses. When the general of an army blunders, it may easily neutralize the army's efficiency as a fighting unit.

The time has, perhaps, not yet come when we may reduce the determinative element to a body of principles, or even working rules. It contains, today, too many unknown and variable factors. The following, therefore, makes no attempt to deal with this aspect of industry; it covers the element of management alone.

The problem of management, broadly regarded, consists in the practical application of two great intellectual processes. Whatever the end aimed at, whether the conduct of a military campaign or the manufacture of an industrial product, the processes involved are those of analysis and synthesis. In proportion as analysis is keen and correct, and synthesis is sure and unerring, so will be the resulting efficiency. If our power of synthesis is less than our power of analysis, academic and theoretical "systems" will result. If, on the contrary, we neglect analysis and force synthesis without having shrewdly studied our ground, some, and even considerable, practical success may result, but there will be a great waste of opportunity and failure to attain the most efficient results.

The neglect of analysis and the forceful use of synthesis are typical of the successful businesses of the past. The strong, shrewd, "practical" man could afford to neglect a careful analysis of his problem, because he had a very large margin of profit to draw on.

His wastes were great, his lost opportunities many, but he knew nothing about them and cared less, because his operations were successful in proportion to his expectations. If his profits were not, as we can see now, as large as they should have been, they were at least as large as those of everyone else.

During the last fifteen years there has been a considerable development of the art of analysis in the problems of management. The early beginnings of this movement were characterized by a desire for more exact knowledge. It began to be realized that manufacturing is, in fact, made up of a long series of very small steps, and that it is desirable to ascertain the money value of these steps, so that comparisons may be made. In this way the movement toward cost accounting began and presently reached a high state of development.

The next step on the path of development of the practical use of analysis was due to the desire of employers of labor to find some satisfactory basis for rewarding it according to results.

To meet this need, the particular kind of analysis now known as "time study" was rediscovered.

So far we have been considering the instrument of analysis as applied to the individual piece or component, or, to use a convenient but unbeautiful word, to the job. Once, however, that analysis set out on its career, its sphere of action steadily widened.

The routing of product and the layout of machines is, then, a further development of the instrument of analysis that has very important bearing on efficiency. It is of course nothing novel. New plants have always given some attention to the matter. But its exact study, its investigation by charts and diagrams, the adaptation of buildings to special agreement with their uses, the careful scrutiny of methods of transporting product within the plant—all these are very modern applications of the instrument of analysis, which are having important economic results.

It is evident that all this activity—the separate kinds of effort involved in acquiring material, bringing it into storage, moving it from place to place at the right moment, providing drawings and instructions, communicating them to the persons concerned, testing the product, and getting it out of the plant by a given date—involves a large number of steps, in any of which considerable inefficiency may exist without any more noticeable result than a general sluggishness of working, which in its turn may have come to be regarded as the natural condition in the plant. It is obvious, therefore, that

here is a field for the instrument of analysis in which important laurels may be expected to be gathered.

The modern name for the organization which is, or should be, built up on a thorough analysis of the different activities concerned in the movements of material and instructions varies according to the fancy of the user. By some it is called "planning," by others "dispatching," but by whatever name it is known it has always been in existence in all plants from the beginnings of the factory system, for the simple reason that business could not be done without it. The only difference between modern types of planning and the older practice is that, today, it is recognized as a subject of analysis, and that the planning department, or by whatever name it is known is not merely a haphazard outgrowth of the business but is organized after a careful analysis of the needs of the plant, with special reference to the kind, urgency, and aim of the operations carried on.

In the foregoing paragraphs we have considered the principal applications of the instrument of analysis as found in modern industrial management. Whatever progress has been made in the past decade or two is due principally to the revival of this important instrument and its application to some of the most pressing problems of management. But there is one thing that must not be overlooked. Analysis is not a constructive instrument. We can make nothing by its aid. It distinguishes, it provides very accurate knowledge, it eliminates, but it does not build. That is the task of synthesis.

What, then, is synthesis? What kind of activities are grouped under that head? In what does it differ from analysis, and in what practical ways is it applied? These are interesting questions and will be briefly discussed.

Just as analysis is the art of separating and dissecting, so synthesis is the art of combining. As a practical art it naturally precedes analysis, or, more correctly, it precedes conscious analysis. While the elements of a problem are simple, the mind, intent on its aim, analyzes unconsciously to a degree sufficient for its needs. But in proportion as the number of elements grows—and in modern industry they have grown to a very large number—then conscious analysis must be brought into play, not to supersede but to supplement the operations of synthesis.

The art of management up to a few years ago was wholly carried on by synthetical methods. In the industrial sense, synthesis is the

combination of the faculties of men—that is, their capacities to do work of various kinds, with material—that is, with some object on which different kinds of work could be performed. Nothing whatever of the necessity for employing the synthetical method has been removed or superseded by the introduction of analysis. The old management has not been improved out of existence. It has not been even diminished in importance. It has only been given a new tool or instrument—an instrument of study, a microscope, something by which the true inwardness of problems may be searched out, instead of having to rely on their surface appearance and their face value. The old problems of management still remain problems, still require synthetical solution, but the chances of their correct solution are greatly aided by the modern uses of analysis.

The main distinction between synthesis and analysis in this connection is that synthesis is concerned with fashioning means to effect large ends, and analysis is concerned with the correct local use of given means. The view taken by synthesis is a wide and comprehensive one; it surveys the whole field of action; its great task is to determine "what to do." The view taken by analysis, on the other hand, is a narrow and limited one; it concerns itself with the infinitely small. Its task is to say "how to use certain means to the best advantage."

See also p. 844. The Range of Time and Motion Study.
p. 850. The New Industrial Leadership.
p. 588. Time Study.
p. 589. Motion Study.
p. 354. An Organization of the Sales Department.

B. AN ANALYSIS OF "BUSINESS JUDGMENT"[1]

[The student will do well to bear in mind that the expression "business judgment" is used in different senses by different persons. Some use the expression in an inclusive sense, meaning the formation of a judgment on the basis of objective and definite data when such data are available and meaning also the formation of a judgment when the data are not so satisfactory; when the act seems almost intuitive, indeed. Others use the expression in a narrower sense with particular reference to those cases where the data are not in

[1] By F. A. Kingsbury.

simple and satisfactory condition. It will be apparent that the following selection uses the term in its inclusive sense.]

What is often called "business judgment" is, like judgment in any other field, a complex process involving usually a whole series of interdependent judgments and inferences. To this process the psychologist commonly applies such terms as "reasoning," or "purposive thinking," or "reflective thinking," distinguishing it sharply from that casual, aimless sort of revery sometimes dignified by the name "thinking." The types of activity involved in reasoning about a business problem, however much they may differ in content and detail, are fundamentally like those involved in reasoning about problems of law, medicine, literature, or science; and with such qualifications as are hereinafter pointed out, an analysis of the elements in an act of purposive thinking about any sort of problem applies as well to thinking about business problems.

A functional or behavioristic psychology regards reasoning, like instinct, habit, and memory, as primarily a way in which the individual adjusts himself to his physical and social environment, that is, as a method of solving problems, although on a higher and more complex level than the other ways named. Instincts provide unlearned (i.e., inherited) methods of meeting in a stereotyped way certain sorts of problematic situations which are relatively universal for the race. Habits are individually acquired methods of solving problems which recur in one's experience sufficiently often to become more or less automatic in their operation. Memory provides a method of problem-solving through recalling ways in which one has previously met similar situations. But where instincts, habits, and memories give us "old" solutions, it is the function of reasoning to provide workable, "new" solutions for types of difficulty hitherto not met. This is made possible by the selection and utilization in new ways and in new combinations of the effects of previous experience.

In behavioristic terms an act of reasoning would be described as a protracted act or series of interdependent acts called forth by some situation in which behavior is thwarted by an obstacle, real or anticipated, which cannot be directly resolved by the simpler habitual or instinctive mechanisms. In successful reasoning the delay in consummating the act permits the functioning of discriminative and integrative (associative) processes which lead to behavior tending

to relieve the original difficulty. The formal mechanisms in which these discriminatory and integrative processes are embodied may be one or more of several kinds, varying with the habits of the individual and the nature of the materials, and including vocal and subvocal reactions, imagery of various verbal or concrete types, and incipient or even overt motor impulses and attitudes. The precise character of these mechanisms is of less significance that the use made of them.

Any complete act of reflective thinking, whether it deals with business problems or other problems, may be described as involving the following elements:

1. A difficulty, real or anticipated, not suggesting directly any method of solution recognized as feasible.

2. The definition of the problem and location of the difficulty, by analysis of the situation into its essential and nonessential factors; a comparative and discriminative process.

3. As a result of such location of the essential factors, the suggestion of a partial or complete solution, through the ordinary mechanisms of associative suggestion.

4. Elaboration and critical evaluation of the suggested solutions to ascertain their probable worth.

5. Acceptance of solution and consequent action, if valid; or rejection, and repetition of stages 2, 3, and 4 until satisfactory solution appears.

It is not, of course, always possible to trace these as temporally distinct and successive stages. In certain types of situation some of these processes may be subordinated to or merged in others. Nevertheless, we may use these divisions as a basis for a further analysis and description of the processes commonly involved in reasoning.

1. "A difficulty, realized or anticipated, not suggesting directly any method of solution recognized as feasible." It seems trite, yet it is exceedingly important, to bear in mind that no purposive thinking ever occurs except on occasion of a problem to be solved, a difficulty to be overcome. The problem may, perhaps, be an intellectual one, arising from apparent incompatibility between accepted beliefs. In such cases, the immediate problem may be to "explain" the situation. Thus, a manufacturer who has saturated himself during the war and post-war period with the conviction that the sure way to large profits is through buying large stocks of materials for future use, now finds himself faced by the conviction that he is not making profits, but is suffering losses. His first problem is to readjust and revise these con-

flicting convictions, to find an explanation; afterward he will decide what to do about it. But in business judgments, the difficulty is usually a practical one; here is a concrete situation calling for prompt action—growing competition, increasing complaints, threatened litigation, financial stringency, a destructive fire—but the way to action is blocked. Were there no blocking or inhibition present, in the form of fear, uncertainty, doubt, or powerlessness to act, some kind of action, either reflexive, instinctive, or habitual, would follow at once. The fact that the impulse to act is somehow inhibited is what puts the whole situation on the level of rational and volitional action.

Such problems may be concerned either with setting up ends to be attained, or with finding means for the attainment of ends; although inasmuch as most ends are instrumental to some more remote end, the distinction is not for present purposes a vital one. Again, the problem may call for the making of decisions which are designed to influence a large number of acts (as in the formulation of some business policy); or the intention may be to affect only a single action.

The difficulty may present itself in various forms:

a) The situation may suggest no course of action whatever; a "blank wall"; a "baffled feeling"; as, for example, when one meets with a totally unexpected disaster.

b) The situation may suggest a possible course of action, but of doubtful value; i.e., there are verbal or other inhibitions present, characteristic of the attitude of doubt, which prevent action along the line suggested; as, for example, when one is confronted with the opportunity to obtain, at an abnormally low price, a stock of goods larger than one ordinarily feels able to buy.

c) The situation may suggest two or more alternative courses of action whose relative value is not evident. That is, it is not clear which promises greater ease of accomplishment, economy of time or expense, certainty or quantity of result, freedom from annoying after-effects, or other advantage. Whether or not all these considerations present themselves vividly, the psychophysical mechanisms they symbolize may be active to such a degree that no one alternative leads to free, unimpeded action; the alternatives block one another, until such time as reasoned reflection succeeds in making one of the alternatives dominant. An example would be the problem of deciding between several possible sales policies or methods—selling through jobber, direct to retailer, to mail-order house, direct to customer, etc.

In situations of this kind, where possible courses of action have already suggested themselves; stages 2 and 3 may be merged in stage 4, the deliberative criticism of the alternatives and of their anticipated consequences.

2. The next stage, "the definition of the problem and location of the difficulty," is often synchronous with the first stage; that is, the problem makes its first appearance in very definite form. But many business problems are of a character so involved that the crux of the difficulty is not immediately apparent, and the situation has to be analyzed into its significant and non-significant factors. Thus, a slump in sales in a given territory may be due to any of a considerable number of factors, and a large part of the task of relieving this particular difficulty consists in analyzing the situation into its factors, geographical, financial, personal, social, political, etc., and determining which are significant and to what extent. Only then can one look for an adequate solution to suggest itself. The problem may, on analysis, define itself as essentially a problem of (*a*) putting in a more efficient salesman; (*b*) meeting prices or terms of a local competitor; (*c*) improving transportation or delivery conditions; (*d*) counteracting harmful propaganda; (*e*) making connections with new dealers; (*f*) stimulating present dealers to larger efforts, or something else. One or another of these, in turn, may call for still further definition.

Defining the problem calls for the accumulating and examining of such facts as are likely to reveal the real nature of the problem, and isolate it from the mass of irrelevant and confusing attendant circumstances. Here the definite adoption of an attitute of suspended judgment, pending the location of the difficulty, helps to inhibit the tendency to follow impulsively suggestions which in most cases would prove false leads, obscuring the issue and wasting time and energy.

These more or less relevant facts may be gotten at either through casual observation or inquiry, or through systematic investigation (experiment, accumulation of data from records, etc.), and their accumulation is stimulated, guided, and facilitated by the recall (or reading of inquiry) of similar situations. If the facts in the case are too numerous or too complex to be held in mind while they are being reviewed, they may be systematically arranged so as to facilitate suggestions of solutions: (*a*) by use of pictorial or graphic devices; for example, tack maps of sales territories; charts analyzing a business organization; graphs showing fluctuations of price, output, etc.;

diagrams of various sorts, etc.; (*b*) by statistical tabulations and analyses; (*c*) by outlines or summaries, written or verbal; (*d*) or even by the unsystematic jotting down of suggestions, lists of factors, arguments, etc. Often a pencil in hand serves as a stimulus to thought.

Throughout this survey, a discriminative and selective activity has been going on. Certain factors have appeared which further the progress of thought (i.e., suggest associations) in the direction desired. Others suggest no associations beyond an attitude of negation. The latter are rejected from further consideration; the former, or the associates they suggest, carry the thinking process on to the next stage.

3. "The suggestion of solutions"; the inference stage. During the analysis of the problem not only have certain factors suggested themselves as significant, but they have (often simultaneously with their appearance) suggested possible courses of action, or pointed the direction for further inquiry. This, of course, occurs through the ordinary associative mechanisms, and therefore implies previous experiences, first-hand or second-hand, involving similar elements. Very frequently this is the crucial point in business judgments. Mistakes in judgment are very often directly traceable to inadequate knowledge, and a consequent insufficiency of potential suggestions. Men fail not only because they "don't know," but because often they "don't know that they don't know." On the other hand, the successful "captain of industry" is very frequently a man of wide information concerning matters political, geographical, historical, or scientific, which to his smaller-minded contemporary seem irrelevant and useless. Nevertheless, this rich background of ideas and viewpoints enables him to anticipate the effects on general business conditions, and consequently on his own affairs, of apparently remote yet real influences, and thus to provide effectively against future contingencies. A wealth of experiences is of inestimable value in making for sound and ready business judgment, not only in providing direct suggestions, but in aiding in the organization, interpretation, and evaluation of other experiences.

Often the intermediate associates which logically link situation to suggestion are not consciously present; one leaps from problem to solution without stopping to trace his path, and perhaps without being able to trace it if he tries. This occurs, of course, in those fields in which the individual is most practiced. It involves the

phenomenon called "associative shifting," where the chain of associates A–B–C–D–E is, by repeated practice, condensed into the direct association A–E. Such acts of mental habit are often called "practical judgments," and they constitute a considerable part of the everyday thinking of the business man. But in most new situations, of course, they constitute only a fraction of the total reflective process.

These suggestions of solutions may appear in various forms:

a) One may recall some concept, term, formula, rule of procedure, or other verbal generalization which has been developed around previous experiences of this sort. This is the usual thing if the problem is of a sort that naturally leads to some categorical classification of the situation; it is therefore more common in such fields as legal reasoning, medical diagnosis, and other fields having a considerable body of technical terminology than in most business situations. Nevertheless, inferences in business problems often assume the form of classifications of this, hat, or the other situation under such verbal generalizations as "safe," "be cautious," "likely to make trouble," "unprofitable," "risky," "speculative," "unethical," "good bargain," "worth investigating," or other categories which go far to determine what action shall follow.

b) One may recall some specific previous situation, recognized as similar in its essentials, and the procedure there followed, with its consequences.

c) One may feel impelled toward a certain course of action, suggested by some element of the situation, but not referable to any specific experience.

Fertility of suggestion is affected by various factors: (*a*) Native ability, the inherent quality of brain structure which makes possible varied and prompt recall; in practice, the influence of this factor cannot with certainty be separated from that of other factors; (*b*) extent of experience or knowledge in the field concerned and in related fields (even though the relation may apparently not be close); (*c*) extent to which these experiences and ideas have been utilized, organized, or reflected upon, thus enriching, systematizing, and strengthening their associative connections; (*d*) degree of interest in the problem, and consequent attention and care devoted thereto; (*e*) completeness of analysis of the problem; (*f*) systematic arrangement of data, as previously described.

4. "Elaboration and critical evaluation of the suggested solutions." If the comparative, discriminative, and associative processes involved in the analysis of the problem and its suggestions for solution have sufficed to overcome whatever inhibitions to action were present, i.e., if they have been sufficient to establish an attitude of belief in the validity of the solution, decision and action will follow. In a complex situation the inhibiting influences are not thus easily resolved. If doubt remains, or if the case is as described in 1*c*, wherein definite but not yet evaluated alternatives have already suggested themselves, elaboration and evaluation of the hypothetical solution is necessary. By "elaboration" is meant the consideration of the consequences, positive and negative, favorable and unfavorable, expected to follow from the adoption of the hypothetical solution. These consequences, suggested through the ordinary associative mechanisms (and hence, like other inferences, dependent on previous experiences), may perhaps take the form of imagery, whereby one pictures to himself the results in visual, auditory, motor, or other symbols; often the imagery assumes the form of a semidramatic rehearsal of the anticipated situation; or (as is more frequently the case with thinkers accustomed to deal with abstract relationships) they may be couched in vocal or subvocal word symbols.

Usually these suggestions are in some degree affectively toned, either agreeably or disagreeably. That is, the suggestion of certain consequences is characterized by positive emotional reactions and kinestheses, which we variously call feelings of approval, affirmation, or satisfaction, desire, liking, etc. Other suggestions are characterized by negative reactions of aversion, disapproval, dissatisfaction. These reactions play a central part in determining the outcome of the thought activity, since those reflective processes which arouse the negative, self-inhibiting type of reaction thereby tend to be dismissed from further consideration; while those arousing the affirmative, self-reinforcing type of responses determine the direction the reasoning process shall follow. Hence the importance of maintaining the critical attitude previously referred to, so that the case may not be closed through the urgency of some special emotional influence until the evidence is all in. What is called "good judgment" is in large degree the capacity for and habit of withstanding the strong desires or aversions which are urging action, until other considerations have a chance to be reviewed, their values appreciated, and a decision

reached in terms of far-reaching as well as immediate considerations. Conversely, "poor judgment" often connotes not lack of ability to foresee probable consequences, but habitually insufficient resistance to urgent impulses. In this connection it may not be amiss to call attention to the very common habit of making decisions in line with personal predilections, and bolstering them up with reasons worked out to make the decision look plausible—what the psychologist calls "post-rationalizations," and which are, of course, in the main irrational.

This process of deliberation and evaluation of the hypothetical solution (or the alternative solutions—for indeed, most decisions resolve themselves into some sort of choice, even if no more than "to do or not to do") is then largely a matter of weighing emotionally toned, anticipated consequences. When one set of impulses succeeds in becoming dominant, i.e., in dissolving the inhibitions, action follows. This readiness to act constitutes the essence of the attitude we call "belief." But frequently doubt remains and action is suspended. Further critical testing is called for. This testing may be either (*a*) explicit (on the "action level," experimental)—by trying it out on a small scale before taking larger risks, to ascertain whether actual consequences correspond to those anticipated; or (*b*) implicit (on the "thought level," "rational")—by (1) further comparison with similar or analogous situations whose consequences are known; (2) comparison with other accepted general principles or formulas than those used in reaching the hypothesis; (3) comparison with testimony of authorities, persons or books, on similar or related problems; (4) submission of data, methods, and conclusions to competent critics, to discover possible omissions or errors.

The adequacy of this critical evaluation depends, therefore, on a variety of conditions. In business judgments (as in other kinds), these are emotional and volitional as well as intellectual. The value of critical foresight may be negated by ill-founded antipathies or prejudices. In business, even more than in other fields, correct judgments depend largely on the accuracy with which one estimates the probabilities of human behavior, either individual or collective. While scientific judgments largely involve insight into the behavior of non-human objects, and medical and legal judgments the correct reference of cases to certain categories, business judgment is largely concerned with contingencies of human behavior. Therefore, a correct comprehension of the influences that determine individual or

mass behavior—likes and dislikes, ethical and aesthetic standards, customs and fashions, instincts and acquired tendencies, what people are likely to do or not to do under certain circumstances—is of primary importance in business judgment.

5. Whereas the terminus of a scientific judgment may be the formulation, modification, or verification of a verbal generalization, practical judgments eventuate in more overt forms of behavior. The action need not follow immediately. The direct outcome of a reasoned business decision may be a more or less explicitly formulated program for future action, which is to be consumated when certain future conditions are realized. The realization of these conditions then automatically brings about this action, the psychologically crucial point being not the moment of action, but the moment of decision. If the program of action is designed to meet in a uniform way a large number of similar situations, we call it the formulation of a business policy. The determination of a policy usually involves consideration of a greater and more significant range of consequences than does a decision on a single act, which is not expected to produce such weighty or long-continued consequences, or stand as a binding precedent in the minds of all persons concerned. But apart from these minor differences, the psychophysical mechanisms are fundamentally the same in all acts of reasoning.

To summarize:

1. Acts of business judgment may be defective for various reasons: (*a*) failure to formulate problem correctly and definitely; (*b*) failure to discriminate between significant and non-significant elements in the situation; (*c*) experience and information inadequate to suggest associations; (*d*) experiences recalled too imperfectly or too slowly for the exigencies of the situation; (*e*) unfamiliarity with concepts, terminology, technique, and practices prevalent in the field concerned; (*f*) data too poorly organized to suggest solutions readily; (*g*) inferences from incomplete and non-representative data; (*h*) insufficient interest, attention, and care; (*i*) failure to maintain critical attitude; liability to "snap judgment"; (*j*) emotional bias, giving too much or too little weight to various factors.

2. Or, from a somewhat different standpoint, we may say that efficiency in business judgment depends on: (*a*) quality of brain structure; (*b*) aptness (native or acquired) for seeing similarities and differences in the field concerned; (*c*) practice in analyzing problems; (*d*) adequate knowledge of facts and principles, and readiness in

recalling them; (*e*) knowledge of and skill in using special forms of technique for getting and organizing data (experiment, statistics, etc.); (*f*) organizing data and keeping results organized as work proceeds; (*g*) exercise of care in getting sufficient body of data to insure reliability of conclusions; (*h*) exercise of care in making as complete critical verification as circumstances permit; (*i*) maintenance of critical attitude (suspended judgment); habitual resistance to immediate impulses.

See also p. 649. The Significance of the Human Equation in Business Problems.
p. 651. The Formation of "Judgments."

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2. THERE IS NO SINGLE CORRECT FORM OF ORGANIZATION

A[1]

Various activities that are not industrial, such as the church, the civil government, the army, the navy, educational organizations, charitable organizations, all involve size and numbers and complexity, and they are all organized; but good industrial organization will be likely to differ from these other organizations, and all organizations will differ somewhat from each other, because the objects, the results that are sought, and the way these results must be attained, are different; and, moreover, the material out of which the organization is made differs in kind.

It is, of course, true that there is much that is common to all effective endeavor: the definite knowledge of what one wishes to accomplish; the principles of directing and controlling effectively large numbers of people; making the most of different kinds of skill; the securing of co-operation, so that each one helps instead of hinders another; the systematic and orderly way of doing things, so that there are no neglected steps, no false movements, no lost time—are all common to good organizations of all kinds. But, with differing purposes, the factors that make organization have varying importance. With one purpose in view, the principle of the division of labor for specialization of skill may be all-important; in another situation, this may become insignificant in comparison with the

[1] Adapted by permission from Russell Robb, *Lectures on Organization*, pp. 2–34. (Privately printed, 1910.)

proper control and direction of large numbers. The problem in another organization may be the systematization and division of work mainly to bring order and efficiency into a situation of complexity. The significant feature in another case may be almost wholly a question of dispatch, where the question of economy even may hinge much more on the time required than on any other factor. Again, we may have success hinging upon systems of accounting, records, and statistics, where the accurate knowledge of costs and other details of the business and the system for securing these may be the central factor about which the organization is constructed.

In the popular mind, perfect organization usually is associated with the army. The division of the men into companies and regiments, the clearly defined duties and authority of the officers, the discipline that secures precision in all evolutions and obedience to all commands of the superiors, suggest to most people the perfection of concerted action, and furnish the type to which they feel that all organizations should conform as nearly as possible. An army in modern times, with its different branches of service, its attention to commissary and sanitation, its great multiplicity of technical appliances of war, its connection with the activities of civil life, becomes very complex; but in the beginning, military organization was a necessity in order to direct and handle effectively large numbers of men, and so to prevent the hordes who went fighting from being merely a mob. The great numbers acting together could not act effectively unless there were order and system in all their evolutions, and an organization binding the order and system together. Moreover, the product came in one supreme moment: the organization was for an emergency. Its whole success or failure was shown by the action of the army at a critical time; and for this reason military organization has taken a severe line, in which everything is subordinated to obedience and definiteness of procedure and certainty of predetermined evolution and action upon command. Authority and responsibility taper down with evenness, each one knowing his exact limitations and his part. Each one in authority must be trained to assume instantly all the duties of the one next above, for the captain of one moment may be colonel in the next.

Military organization has contributed much to all other types of organization through its example of the value of discipline, the usefulness of definite procedure, and the effectiveness in administration of placing responsibility, but it has been the cause of mistakes in

building up other organizations, through the forcing into prominence of the main features of a military organization when the end that is sought is much more influenced by other factors, when the necessity for control is less than for specialization of effort and for the co-ordination of different kinds of action. This becomes plainer when one considers, for instance, an industrial organization depending for its success very largely upon the ability with which the principles of division of labor are applied. There are many examples. The success or failure of the watch-industry would not depend upon instant obedience, upon definite evolutions of men, upon predetermined movement in emergency, upon a definite line of succession in authority; it would depend upon such things as study and care and economy in purchasing materials, upon the development of processes to make the most of each worker's special skill and ability, the saving of time in the handling of the product, the working of the plant to save interest and rent, the discovery of consumers, and the prompt delivery of the product. The main purpose is different from the main military purpose, and the organization must vary accordingly.

Large and complex construction is often undertaken where, in the words of contracts, "time is of the essence." The need for the structure may be vital to the integrity of an important business already established. The saving in interest and in earning power, if the work is completed in months instead of in a year or two, may be a large amount. The organization for such an undertaking will not be the same as for deliberate construction systematized in all details for the lowest total construction-cost. It may be necessary to cut "red tape" that would be desirable in other situations, it may pay to take the chances of less thorough deliberation of plans, the lines of authority even may be changed—all because the relative importance of factors is changed.

The construction of the great irrigating reservoirs in India, where a few years ago during the famine so many of the natives were employed, furnishes a good example of the variation in organizations according to the material one has to work with. One can imagine approximately what sort of an organization would be necessary in most other places to undertake the vast excavations necessary to form reservoirs in great irrigating works: there would be a large mechanical equipment of steam-shovels, with the minor organization of drivers, mechanicians, and superintendents, the systems of records,

of fuel-supply and repairs; the placing of equipment; the orderly procedure of the work; the great number of workmen to direct and supervise; the system of pay, shelter, commissary, sanitation—all would have to be molded into a great comprehensive organization. In India there were no steam-shovels, mechanicians, fuel-supply, repairs, shelters, or commissary. The excavation was done directly by hordes of natives in gangs of twenty or thirty, each with his or her basket, and one with his little "scooper" or koiti. When the basket was filled, it went on the worker's head and was carried to the dump, where the native received a small tag that entitled him to payment for one basketful of excavation. The workers consisted of gangs, over which were the foremen who furnished the laborers for the work. There was no system of housing, for there were no shelters: all slept on the ground in the open. There was no commissary organization, for the workers "found themselves," and in any case would have refused any food prepared for them, because of caste prejudice. The payment of workers required no elaborate system of pay-rolls and receipts, because each worker simply cashed in the tags he had received. No doubt those in charge of these Indian excavations had their problems of organization, but they were different from our problems, and probably the most of our approved systems would have been of about as much use as an American typewriter to a Chinese merchant.

There are all kinds of industries, and one is perhaps as good as another for the purpose of illustrating organization. If one is credibly informed, the organization of some of the patent-medicine companies differs considerably from that of other manufacturing companies, and yet they are still ably organized. There is at least one where two or three rooms in a large building are devoted to the manufacture of the medicine, a minor function in the organization. The remainder of the building is largely devoted to a printing establishment for the preparation of advertising matter, to advertising departments, correspondence-clerks, and stenographers. Here we have a manufacturing establishment, but the purpose and conditions require special attention to the office-system. The accomplishment of the purpose is not greatly affected by attention to manufacturing methods and details, but is very greatly affected by skill in advertisement and system in the departments where the real effort and most of the expense lie.

Most organizations have grown gradually, and the conditions surrounding this growth often influence greatly the form that the final organization takes. Long existence of customs and methods and the consequent knowledge of the plan throughout the organization may be of more importance than the features that might be secured by a theoretically better structure. It is understood, for instance, that the very successful Studebaker organization is administered by an executive committee of five members, each member of which is at the head of a functional department of the business. Committees are not ordinarily very effective as heads of undertakings. They have difficulty in reaching decisions, and one member is likely to prove dominant and carry his ideas without being responsible for the results. The Studebaker organization, however, has grown up about a family of five brothers, all able and active in the business. From small beginnings they had threshed out their problems together and had learned the art of conference. They had found how to draw from each his contribution to the general knowledge and to the particular question, and they had discovered ways of reaching conclusions without interminable discussions or unplaced responsibility. One might hesitate to form a new organization on this plan, but he would just as surely fail to discard it when so completely established and so well proved in efficiency. In parts, at least, of many organizations one finds variations from the theoretically best plan on account of the personality or particular ability of important officers or heads.

It will be unfortunate if the emphasis given here to the diversity of conditions and to the difference in the purposes of undertakings should be construed as an argument that no general principles can be applied to organization. It is intended simply to show that there is no "royal road," no formula that, once learned, may be applied in all cases with the assurance that the result will be perfect harmony, efficiency, and economy, and a sure path to the main purpose in view. This is not an imagined difficulty. We all are inclined to get a bit twisted toward some favorite panacea, and if one is to attempt to better a business organization, it helps greatly to be able to approach the problem with an open mind, and not to have a special predilection toward a factor that one has somewhere found admirable.

The gain from organization is so evident when it is applied to a confused situation, and the satisfaction so great in having affairs run smoothly, that, as we continue grouping forces and introducing

system, we easily become convinced that we cannot have too much of it. Like the "diminishing returns in agriculture," however, the returns from increasing organization do not continue proportional to the efforts, and limits are reached beyond which one may well proceed with care. It becomes necessary sometimes to remind ourselves that organization, as an end in itself, is of no value. A business organization is for the purpose of accomplishing definite pieces of work, of arriving at a definite result with the least expenditure of labor and material, the smallest expenditure for plant, and the shortest time of use of the plant; and if organization does not prevent waste or enable us to get results attainable in no other way, it has no value.

Now and then there are men who seem to go at once to the root of a question, and who, from a mass of detailed explanation, exposition, and talk, seem suddenly to pick from the medley the two or three salient features—the things of such transcendent importance that all else drops away as if mere comment. Such men have a proper sense of proportion and the true sense of thoroughness, because they do not get involved in detail before they have blocked out the plan.

When it is urged that it is not worth while to follow all detail in every direction, when it is urged that one must first make sure that he knows in which direction it is most profitable, in a broad sense, to work, this must not be mistaken as advising a policy of "good enough," for it is not that; it is the policy of refusing to waste our resources on the non-essential and the ineffectual; it is being dissatisfied with the accomplishment of the infinitesimal in one direction when accomplishment of magnitude is possible in another.

B[1]

It is obvious that the organization of a plant will depend largely upon its size and the degree to which it is specialized. Increased size naturally brings with it greater subdivision of labor and the consequent need of added co-ordinative influences. Under the older and simpler systems of production, when small numbers of men were the rule, the relations between master and man were very simple. Each man was competent to perform any and all operations, producing perhaps the entire article himself. The instructions, few

[1] Adapted by permission from D. S. Kimball, *Principles of Industrial Organization*, pp. 68–70. (McGraw-Hill Book Company, 1913.)

and simple, were given verbally, and duplication in a modern sense was unnecessary. As the size of industries has grown, as specialization and division of labor have been extended and as special or scientific knowledge has become more and more necessary, these simple relations have been forcibly expanded and the concerted labors of master and man have been replaced by administrative, planning, and constructive departments, to properly co-ordinate the work of which has become a study in itself.

The tendency toward complexity in organization due to increased size is not so great, however, as that due to the character of the industry and the degree to which it is specialized. Manufacturing industries are, broadly speaking, of two general classes, namely, continuous and intermittent. In a continuous process the material goes in at the receiving end of the plant, is worked continuously, and appears at the shipping room as finished product. A continuous process may be either analytical or synthetical; that is, it may take some natural product and separate it into component parts or change its general form; as, for instance, the industries built on salt products, ore, oil and sugar refineries, saw-mills, etc. Or they may take a few natural products and passing them through fixed processes build them up into some other form, as may be seen in paint works and wall-paper factories. In general, such industries deal only with a few raw materials, these passing in at one end of the factory and flowing, so to speak, through a number of fixed processes and passing out at the other end in the form of a limited number of finished products and by-products. The organization that the personnel of such a plant will most naturally take will depend on the character of the industry, but will, in general, be comparatively simple.

Intermittent or interrupted industries, on the other hand, may take many kinds of raw material, carry them to any desired stage of completion, store the finished or semi-finished parts when necessary, and assemble the various kinds of finished product as the market requires. This finished product may cover a wide range both as to relative size and character. Ship-building plants, agriculture implement works, and plants manufacturing electrical machinery are excellent examples of interrupted industries which form by far the larger part of organized industry. The above classification, is, of course, not clearly defined; in fact, these types of inoustry represent extreme cases rather than distinct classes. The natural tendency toward specialization constantly tends to limit

the range of intermittent processes and this, in an extreme case, might reduce a factory of the intermittent type to one of the continuous type. Many factories, indeed, have both continuous and interrupted processes in operation at the same time. Plants of this kind tend naturally to divide into departments and are naturally more complex in character than those of the continuous type.

Aside from these considerations, the exact form of organization of any plant nearly always depends to some extent on the character and ability of the men available. Able men are always rare and the exact subdivision of authority and responsibility often depends on this factor rather than on a more logical basis of an abstract analysis of the problem. For this reason and the other reasons advanced above, it is not possible to formulate fixed rules for planning industrial organizations. There are, however, certain general principles that long experience has shown to apply to all forms of organization and that are, therefore, worthy of note.

See also p. 565. The Control Problem Varies with Different Types of Industry.

C[1]

"That's the hardest question in business," exclaimed one of the half-dozen managers of distinguished enterprises recently asked to list the vital factors of control in an organization—to take apart the enterprises they have brought to success, and point out the ideas, policies, methods, and results which seem to them so important that the chief himself should have them under his eye and hand.

According as different concerns emphasize one or another factor in their schemes of management, policies of executive control may be roughly divided under five headings:

1. *Detail management.*—Most managers are driving themselves to their physical limit in the handling of the details of service, employment, and especially finances. Some executives have been literally crowded out of this position by the growth of the business and have taken a stand at some point along the current of trade, where by watching every order, every credit, every contract or expense item, they can fairly judge and control the business.

[1] Adapted by permission from C. D. Murphy, *Library of Business Practice*, I, 9–24. (A. W. Shaw Company, 1914.)

2. *Money management.*—Many proprietors and directorates guide their businesses entirely by ledger statements and throw upon subordinates hired to round out their ability all other matters relating to the conduct of the enterprise. In one case a directorate which is managing a business entirely as a matter of investments and profits has never seen the chain of stores from which its dividends come. A detail manager pledged to enthusiasm by a generous salary has authority over everything except financial policies. The disadvantages of this plan are that there is no proprietary control of the methods used in dealing with the trade, nor of the spirit among the men; the business runs at high speed but roughly, with much jarring; and the management has too little real knowledge of conditions to forecast the future most effectively.

3. *Leadership management.*—Encouragement and the rousing of enthusiasm among employees is the contribution this type of manager makes to his business. His is an enterprise that requires extraordinary initiative; his men have to be keyed up to the fighting spirit—they need the "flaming torch" to lead them. Systematized routine is, therefore, left to handle problems where a solution has been found and a precedent established. The management devotes itself to "breaking trail" in every new and difficult path of the enterprise.

4. *Guiding management.*—Some managers and directorates put their entire organization as a tool in the hands of their most brilliant executives, advising and aiding them to carry out for the profit of the concern whatever inspirations promise best or to exercise the particular genius of each. This is the type of business where the manager occupies a broad field and insists only on dividends rather than confining his business to a definite product or service. This policy is especially the recourse of a concern which has outgrown one line—the big business viewpoint, where the manager has perhaps realized his visions and depends on the inspirations of his men for further expansion.

5. *Balanced management.*—Rockefeller's success is credited to the poise which he has always maintained in his corporation. In a business so balanced, neither men, money, nor service has undue emphasis; no one department or method is allowed to excel or overtop others, but every part constantly learns from other lines, constantly is kept up to the mark and in proportion with all others. This type of management combines the last two and rounds out the incompleteness of all.

Study of the work of high executives indicates that they need a background of detail experience and that in emergencies they may have to handle the work of a department, but that they study themselves as frankly as their employees and use their resources to hire men who shall round out their own abilities. Skilled lawyers are constantly at the service of department heads in order to guard contracts; and technical men in a dozen different lines are kept available by various managers who recognize, as Funk has said, that their greatest value is in securing a co-ordinating expert service.

Money management is an extreme of this type. There is in New York a body of men whose ability to manage money is drawing dividends from a score of middle western stores into which none of them has ever stepped. Of buying, of working with men, of planning for expansion and choosing "good towns" for additional branches, they know nothing. This ability they have bought in the person of a trusty auditor and an experienced superintendent. They have limited the business to a cash basis, held down administrative problems to a minimum, and are enabled to control successfully merely by holding the strings of local and total reports, capital and surplus, purchases, sales and expense, profits and dividends. By comparative and graphic financial reports, they are shaping the future of a business in which capital is the big factor. Their method has been to reduce men and service to their lowest terms and shrewdly to pick out the essentials in the control of funds.

An entirely different spirit is behind the policy of the manager who heads and inspires his men. He may have the other factors, finance, service, future plans, well in hand, but his biggest duty, as he sees it, is to lead his men—to teach them that he asks them to go nowhere except where he will go first. He has worked out a course which his enterprise is to take, and in order to keep close to it, he goes first.

The manager who guides instead of leading and furnishing inspiration for his enterprise is making the best of a temperament judicial rather than executive. He hires department heads who are full of ideas but perhaps lack the ability to separate the good from the bad business propositions. His men furnish many ideas and inspirations; he guides their ambitions, challenges the visionary enterprise, and backs his workers in carrying out their plans.

At his best, he attracts to himself partners or subordinates who so round out one another's powers as to make for extraordinary efficiency.

The directorate of a great railroad is said invariably to follow this method in filling the president's chair. Periodically the effectiveness of the system in all departments is discussed. The most recent executive has come up through the engineering or operating or selling department, and in line with his natural bias has brought that function to extraordinary efficiency. Another department far from his experience shows at low ebb. If an executive can be found in this weak department, he is elected to the presidency, and the business is thus made continually to race with itself.

Management is not only the hardest problem in business, but the problem that comes nearest to the secret of failure and success. Up at the top of every business—at the apex of its pyramid of functions—sits some one to whom all lines, wires, and paths of communication lead; where focus problems, records, and plans; from whom radiate the spirit, the policies, and the initiatives which are to write in the future of the enterprise.

3. SOME STATEMENTS ON THE ESSENTIALS OF ORGANIZATION

[The parts of this selection should be read not as authoritative pronouncements in this field, but as a preparation for Selections 4 and 5. Read, asking yourself, "Are these really *essentials?* Are they *principles?* Are they anything more than a *check list* of some rules of action?" (See pp. 756–59.)]

A. "DIMENSIONS" OF ORGANIZATION[1]

In spite of all the wide differences in organizations, we do, to use a mathematical term, know the "dimensions" of organization.

We can conceive of no real organization, for instance, without a *structure* of some kind, without a definite plan. However work is apportioned, and by whatever means it is directed and carried out, we may be sure that the method must have definiteness. We may choose the wrong kind of men to do things, we may not plan to bring their work to them so that their time is most efficiently used, we may

[1] Taken by permission from Russell Robb, *Lectures on Organization*, pp. 2–34. (Privately printed, 1910.)

not use care that special skill is conserved; but if we have some plan that assigns definite duties, we have made a beginning in organization.

We have, too, from our earlier organizations, the examples of the value of *lines of authority*. They add to definiteness. They provide the control and direction by subdividing for that purpose. As authority tapers down, it relieves from responsibility except in the fields for which men are fitted. It provides a definite court of appeal in case of difficulty, and thus saves endless disputes and arguments and consequent confusion. This tapering authority never leaves affairs without a head, and it assures the steady progress of the undertaking because it provides a properly trained supply of new men to fill vacated superior positions.

We know also the value of the factor of *responsibility* in organization, the great incentive there is to careful and energetic work when praise and blame can be accurately placed, and we know that, as this responsibility is segregated, as men are relieved from divided responsibility, initiative increases, and we get the vigor of independent action and leave ability untrammeled.

As undertakings become more complex, the factor of division of labor, of *specialization*, grows in importance. We use great care in choosing men for their different duties according to their fitness, and we increase this fitness and create special skill by narrowing duties so that all attention and study and practice are confined in one direction. In division of labor, advantage is taken of a natural tendency. Men do most readily what they can do best. It increases their interest and enthusiasm and efficiency.

We know that a great factor in organization is "*system*," the mechanism of the whole. It transmits intellectual power, physical power, and skill to the main purpose. It touches all parts of the undertaking, for it is the introduction everywhere of order and method. It relieves those who direct from the details of execution, and it relieves the man with special skill from the duties for which he is less well fitted. It brings work to men in condition for the application of their particular function. It moves all in accustomed routine so that the waste involved in initial effort is avoided. It insures that important steps will not be forgotten. It makes use of mechanical aids to save human labor and thought. It arranges the processes so that the greatest good is secured from the use of the property devoted to the undertaking, and it introduces method

into the use, so that the property is not idle—so that time, the opportunity for accomplishment, is not wasted.

With system and order, the value of *discipline* appears as a factor, for it holds all to the chosen system of working. It has to do with the rules and regulations necessary to carry out the system, with securing obedience to these rules, and with the training and instruction that assures full understanding. As a part of the maintaining of the system is the provision for watchfulness and supervision to keep the movement in the right direction, and the provision for checks to insure against dishonesty, against errors in judgment, and errors from carelessness.

We have another very important factor in organization, in *accounting, records, and statistics*, for these furnish the chart and the compass, the sounding-lead and the log. They are to show us where we are, where we have come from, where we are tending and how fast, and where the shoals lie, and they can tell us, too, how the craft is working. They must be largely depended upon to acquaint those who are directing undertakings with the progress and with the conditions, and this becomes more marked as organizations become larger and more complex, because it becomes increasingly difficult for those at the top to gather their knowledge from their own observation.

An organization is much looked upon as a machine, as a cold-blooded product of synthesis, as an artificial sort of being that recognizes such realities as order, system, discipline, skill, and ability, but has no place anywhere for the "spirit" of anything. But if we are to look upon "organization" as something more than "system," if it is to be a sort of organism, we must recognize another factor, and that is *esprit de corps*. It induces enthusiastic and unselfish working together, with regard more to the whole result than immediately to one's own personal part in the achievement. It leads one to do his part well for the advancement of the whole. It leads one to see the advancement in his part because the whole is gaining in achievement and stability. If we have the military groups, it makes those groups support one another and act together as one; if we have the functional groups, it removes the friction, it covers the borderland, it helps to co-ordinate. It is not easy to define this spirit exactly. It is not mechanical and is not obtainable on command, but it gives life and power to the organization. It will not exist without some understanding of the whole and without respect

for the purpose and methods. It comes down from the top. It is a reflection of the feeling and the policy of those directing, a reflection of the respect of the superiors for their purpose, and of their earnestness in their work, and of their feeling toward those farther down who are joining in the work.

Thus we know pretty definitely the factors that make organization. They are structure, lines of authority, responsibility, division of labor, system, discipline; accounting, records, and statistics; and *esprit de corps*, co-operation, "team play"; but when we attempt to determine the parts played by these factors, we find that their relative importance changes with purpose, conditions, and material. We begin to realize that there is an art of organizing that requires knowledge of aims, processes, men, and conditions, as well as of the principles of organization.

B. "LAWS" OF ORGANIZATION[1]

[Mr. Knoeppel distinguishes between principles of organization and laws of organization. He speaks of six principles of organization:

1. Investigation—finding out what to do.
2. Co-ordination—building the machine which will do it.
3. Records—getting data to serve as basis of conclusions in carrying out what is to be done.
4. Planning—arranging and co-ordinating all details so that the various steps can be rapidly and efficiently carried out.
5. Standardization—carrying out the steps determined in a proper way.
6. Incentives.

His conception is that principles underlie laws, just as the constitution of the United States is, in his mind, an elaboration of the principle that all men are created free and equal; all laws passed must conform to this constitution. He lists the following twelve laws of organization.]

First law, objective.—Working up a tentative plan with reference to the ultimate development desired.

Second law, greatest complication.—The determination of the most complicated phases of the objective.

Third law, concentration.—Placing in each division of a business all of the factors which effect the performance of its own function.

[1] Adapted by permission from an advertisement by C. E. Knoeppel and Company, in *Industrial Management* for November, 1918.

Fourth law, individualism.—Placing in the hands of one man, most competent to handle the work, one or more functions of a business.

Fifth law, mental capacity.—Dividing work in an organization, with reference to the knowledge and ability that will be required of a man in charge of one or more functions of a business.

Sixth law, specialization.—Dividing work so that a man may operate in limited fields rather than cover many diversified fields, in order that a few things may be done well rather than a large number superficially.

Seventh law, responsibility.—Holding a man responsible for the total proven results he secures in his division and not for the details or the methods that he uses in securing these results.

Eighth law, permanency.—Training men to fill other positions than their own and providing for understudies so that changes in an organization may easily be made without disruption.

Ninth law, cross fertilization.—Giving each pivotal man in an organization some opportunity during the year to know the methods of the departments his work influences mostly and of the departments which influence his work.

Tenth law, relationship and instruction.—Providing a man with a clear-cut conception of the relationship existing between himself and those he is associated with, as well as with a written outline of duties, functions, responsibilities, results expected, and methods affecting his work.

Eleventh law, personnel.—Analyzing the requirements of given positions and finding men whose qualifications match the given requirements.

Twelfth law, staff and conferences.—Creating an analytical and advisory body in an organization to co-operate with the executive as well as a conference plan to make it difficult to determine where staff advice ends and line acceptance begins.

See also pp. 820–22 for a criticism of the "Principles" of Taylor and of Emerson.

C. MANAGEMENT "LAWS"[1]

1. The management of any business is solely responsible for all functions pertaining to management.

[1] Taken by permission from L. V. Estes, "Managing for Maximum Production," in *Industrial Management*, LVII (1919), 174.

2. The duties of every position, with the authority and responsibility pertaining to that position, must be determined and recorded.

3. The qualifications for each position must be carefully determined and definitely understood.

4. Individuals possessing these qualifications—or the most of them—must be selected and trained for the positions.

5. The function of preparation for what, how and when work is to be done must be separated from and must precede its execution.

6. Investigation, analysis and standardization of conditions relating to equipment, tools, methods, time, etc., must be carried out by the management.

7. The benefits which result from elimination of losses and wastes must be shared in part with employees.

8. The standards once determined must be recorded for use of the organization as a whole.

9. The determination of a definite and fair day's task for each worker—high and low—must be arranged for.

10. This task must be assigned to the worker best qualified to perform it.

11. Progress being made as to each task assigned must be reported by the execution section to the preparation section at regular intervals.

12. The preparation section must record the progress being made and must know at all times the exact condition of every task for which they have orders.

13. Workers must be trained to do the work by the best and easiest method, following the standard furnished them.

14. Workers must be systematically trained in the performance of a number of tasks with the idea of increasing their ability and value.

15. A reward, proportionate to the time taken as against the time allowed for each task, must be arranged for.

16. Records which are comprehensive and reliable must be compiled showing the results of each worker's efforts.

17. The accumulative cost of every job, order, or task must be available—not necessarily in summary—as material, labor and expense are charged against the same.

18. A special study should be made of the "human factor" in industry and the results of such study practically applied.

19. With standards established, the exceptions either above or below the standard must be brought to attention of the executive in charge and commendation or constructive criticism made.

20. Continued study for further improvement and greater good must be carried on and the results of each study must be applied.

D. ADMINISTRATION AS LEADERSHIP[1]

What is industry? It is more than a division of labor, or a use of capital, or a production of goods, or a distribution of profits. It is an art of life: its inevitable product some sort of character. It is a daily relation of human beings, who are richly endowed with sensibilities, and who possess a pathetic capacity for indifference, shortsightedness, and brutality; and for enthusiasm, loyalty, and sacrifice. An industrial establishment should be a company of brothers banded together for mutual aid and the public good, and sustaining each other with sympathy in a process of self-expression. The most significant thing about industry is that it is a process of dealing with human nature. For men of talent it is chiefly an opportunity for leadership.

Is there anything more natural and reasonable than the suggestion that we endeavor to discover what fine leadership has signified in the past; that we bring the wisdom of former times to bear upon the problems of the present? But, it may be responded, economic leadership of the present sort is recent. It has little history; and what there is has been half forgotten, half concealed. This may be freely conceded. But there is a long and fascinating history of administration, pertaining to the work of great military leaders, and statesmen, diplomats, reformers, the framers of ecclesiastical policy, and other prominent ones who have made for themselves a lasting mark in some field of the domain of organized action.

But it may again be objected that these are different fields of leadership, and that the results of experience cannot be carried over from one to the other. It is true that there are differences in climate, and language, and country, and period. In war the use of artillery involves a different combination of the laws of physics and chemistry from that of the machine in industry. This would be important if we had in view courses in applied physical science. Likewise, it may be urged that political action is not restrained by the cost of production, in the sense that normal industry is; and that

[1] Adapted by permission from E. D. Jones, "Education and Industrial Efficiency," in *Papers and Proceedings of the Twenty-seventh Annual Meeting of the American Economic Association*, V (1914), 215–26.

its results cannot be promptly evaluated or liquidated, to facilitate a turn-over. This would be pertinent if we had in view courses in the administration of values; such as accounting, appraising, financing, and investing. But these objections do not hold when we have in view the study of business administration, as the art of handling men. Here the subject-matter is human nature. The administrator in whatever sphere he works has to judge men, and understand how judiciously imposed responsibilities develop them, and how dangerous failure is to them. He has to safeguard against the same human defects of ill will, selfishness, and despondency; and he places reliance on the same factors of ambition, intelligence, and stability of character.

The material of courses devoted to the human nature of joint action may be grouped, either with the object of bringing out most prominently the personality of individual leaders, or with the main purpose of elucidating the principles, one by one. Best of all, perhaps, is some compromise plan of taking up one principle at a time and elucidating it by a single, carefully studied, and fully presented episode from the life of a great administrator.

Study of individual leaders.—The first arrangement, which aims to bring personality into view, has the advantage of interest and an atmosphere of reality. Individual example, which transcends every other influence upon conduct, is brought into play.

Reviewing the lives of administrators, we may perceive, in such a man as Napoleon, an astonishing mastery of detail, coupled with weakness in demanding too rigid an obedience from his marshals, and in tolerating no advisors of independent mind at his court. Unshakable decision may be seen in Lincoln, while in the pages of Guicciardini we may read of the fatal irresolution of Clement the Seventh.

For the effects of concentration upon principal aims we may review the life of Grant, which seems to have been framed on Bacon's advice, "Go through with that which is in hand, and interlace not business, but of necessity"; while Lord Brougham will provide the picture of scattered energies. On compromise and the middle course Sir Henry Savile can teach us; while Chatham will serve as an illustration of a statesman ready for extreme measures. In Robert E. Lee we may observe the function of religious faith in easing the mind of anxiety, after duty is performed. Efficiency in defeat may be illustrated by Wolsey's extraordinary fertility of invention,

Richelieu's power of making the most of all circumstance, Mazarin's cool objective temper, and Beaconsfield's courage.

If we wish to study the talents which reveal themselves in speed of execution, there is the story of Sir Henry Vane's construction of the English navy under Cromwell, while the philosophy of judicious delays extends from Fabian to Joffrey. On the choice of men Cromwell gives us the grand test of moral force, saying, "I raised such men as had the fear of God before them, and made some conscience of what they did, and from that day forward, I must say to you, they were never beaten."

If we would learn how proper limits may be set to effort, there is the history of Frederick the Great, who never overreached himself, while, contrariwise, in the policy of Laud and Strafford, denominated by the word "thorough," and in the answering "root and branch" of the Parliamentary leaders, we may observe the stern virtue of avoiding half-measures overstepping practical limits.

In Wellington's career we may trace, working together with immense capacity and devotion, the results of aloofness, and indiscriminate praise and blame, and finally, in his political life, intolerance; while Julius Caesar, that predecessor whom he resembled in arms, challenges our admiration for his art of making common cause with his men, his astonishing power of searching out and rewarding those who deserved praise, and his leniency where the motives of his opponents were honorable.

The study of principles.—The advantage of arranging material for the student, with the chief object of bringing out the principles of joint action, is that with such a plan the way is opened for the introduction of precepts from the wisdom literature, gems of advice from the maxim writers, the discussions of strategy, the rules of investigation which constitute the scientific method, together with facts from psychology, and postulates from ethics. By this arrangement of the subject, greater stress is put upon the reasoning involved. The student becomes accustomed to trace analogies between activities of diverse kinds, and to formulate the general or pure principles common to those activities. While the results are not so vivid as in the other arrangement, they tend to be left in the student's mind in a more clear-cut and compact form, apt for ready use, somewhat as a creed or code of action.

Of the many principles of administration which offer themselves for inculcation, but a word or two can be said. What may be

called the mechanics of organization will involve the definition and distribution of authority and responsibility, including the necessary distinctions between planning and execution, and between general matters and details. It will aim at the adjustment of capacity to function, and the establishment of control through standards, sequences, and schedules, with individualized orders and records, tasks and rewards. These various steps combine to bring into existence a group of agencies, co-ordinated to mutual functioning, and taking the form of a system, including every individual and operation, and providing an avenue for the downward passage of ideas associated with initiative and the upward movement of facts connected with response.

When attention is turned to questions of policy, the student will find his energies awakened by the fascinating variety and the sobering depth of significance of the subject. What are the various types of discipline which, in all degrees, from mere instinctive obedience up to the most intelligent loyalty, have ever been relied upon to insure response to constituted authority? In what proportions are confidence in leadership and confidence in the co-operation of comrades blended in discipline? In co-ordinating various agencies, what is the applicability of the rule that only factors of analogous degrees of excellence should be united? "No man seweth a piece of new cloth on an old garment." And what are the limits of the counsel that the manner of a part must conform to the manner essential for the whole?

What, likewise, are the limits of the policy of preliminary preparation, of which the German army has again given the world a striking illustration? It is, undoubtedly, a prime means of storing up a portion of the current energy of an organization for concentrated delivery at a future time. But what of the saying of Pittacus, "Only power reveals the man"; an idea more explicitly expounded by Louis XIV to his son, when he said, "The higher the position, the more it has objects that cannot be seen or known until we occupy it." Again, there is a connection between preliminary preparation, with its tendency toward a fixed objective, and the disregard of small incidental successes. The value of the latter Sir Walter Raleigh, having in mind the uncertainties of fortune, emphasized. In yet another direction preliminary preparation bears upon the policy of seizing the initiative, for it has been well said that one can only plan specifically for what he himself initiates.

When we have as great a respect for human nature as for the nature of machines, and the value of products, we shall want the administrator to understand the character of attention and the significance of pleasure in work. If the time ever comes when what is now accepted as established in psychology, concerning the conditions under which human talents find efficient expression, becomes accepted in industry there will be a great revolution. The nature of many tasks will be changed, and the method of presenting tasks will be changed. [The discussion of matters affecting "the will to do" is here omitted. Consult chapter iii, pp. 153–192.]

Time fails to speak of understudies, and of the arrangement of men in promotion chains, of cabinets and committees, of the means of giving to policy proper flexibility, of the function of compromise, of the many fine rules of diplomacy, and of the democratic theory that those pleasures are greatest which are shared.

Literature.—The literature of administration, considering the sense in which administration is here used, is extensive. First of all, there is biography, infinite in amount, from ancient Plutarch to modern Bradford, writing of *Lee, the American*, and varying in quality from the stern stuff which came from under the heavy hand of Carlyle, to the light workmanship of La Bruyère and Sainte-Beuve. For the study of benevolent tyrants (or the benevolent study of tyrants) there are Mommsen's chapters on Sulla and Julius Caesar. For the rôle of intuition as an aid to leadership, there is Monypenny's *Disraeli*. For tenacity of purpose there is Thayer's *Cavour*. It is well to seek out the great analyzers of human motives, such as Samuel Johnson, Bacon, Bulwer, Goethe, and Emerson.

The philosophy of joint action may be found in the wisdom literature, extending from *Proverbs* to Bacon's *Advancement of Learning*. There is much of it in such maxim writers as La Rochefoucauld and Chamfort, as well as in the aphoristic paragraphs of Goethe and Schopenhauer. Besides these, there are pertinent treatises by lesser men not to be overlooked, such as Sir Walter Raleigh's *Cabinet Council*, John Foster's *Decision of Character*, Lecky's *Map of Life*, and Sir Arthur Help's *Essays*.

The early literature of political science, before modern constitutions so greatly hedged the executive about, is suggestive. And especially thought-provoking is the literature of the Renaissance, when the principles of politics were in such a formative and unreconciled state as the principles of business administration are now.

And here there is particularly to mention the writings of Machiavelli. It is well to accompany the study of the products of this penetrating mind with the explanations of Morley, Villari, and Lord Acton.

Military science deserves careful attention, for it is, at present, the most highly developed branch of administration, with the possible exception of political science. It differs from the latter in that little sacrifice of efficiency has been tolerated for the sake of democratic distribution of power. The emphasis which this literature places on the rugged virtues imparts to it something of the strength of soul of the classics. The great work in this field is that of General Karl von Clausewitz, the father of German strategy. It bears the simple title *On War*. The writings of the officers of the general staffs of Germany, England, and France constitute a reliable body of professional treatises, the general tone of which is surprisingly broad and philosophical.

To offset the influence of studies in strategy, the student may turn to the literature of art, especially of that portion of it which considers art as a phase of self-expression, and as a source of pleasure in work. Here two names suggest themselves to us at once: John Ruskin and William Morris.

It is, of course, unnecessary to make particular reference to the literature of personal efficiency, psychology, and scientific management.

Conclusion.—The project, then, which I would urge upon teachers of economics and business administration, in our colleges and universities, is to regard the business leader not merely as a ruler of matter and force, or as a calculator of value relations, but as a leader of his fellow-men. And this, not alone with reference to the leisure and wealth won from industry, but in the life of industry itself.

See also p. 667. Entrepreneurship and Administrative Qualities.

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4. SOME TYPES OF ORGANIZATION

[Although there is no single correct form of organization of universal application, it is possible to make a survey of existing organizations and to see that they fall into certain rough types. One type shades off into another and a single business unit may have all types and many combinations of types in its various departments.]

A. LINE AND STAFF ORGANIZATION[1]

There are two great principles in organization commonly known as line and staff, or, to use the terms preferred by some industrial engineers, "military" and "functional."

Line organization is essentially simple, mathematical subdivision. An army under a major-general is divided into brigades under brigadier-generals; each brigade is divided into regiments, under their colonels, and each regiment into battalions under lieutenant-colonels or majors; each battalion is divided into companies under captains; each company is again subdivided under its lieutenants, and so on down to the corporal with his squad. Promotion is step by step upward; the private may hope to be made a corporal, a sergeant, a lieutenant, a captain, a major, a colonel, a general. The lines of authority and responsibility run continuously through the whole body from top to bottom, as the veins of the leaf gather to the stalk, and many leaf-stalks to the twig, and many twigs to the branch, and many branches to the trunk; and veins and stalk and twig and branch and trunk have practically similar duties to perform in the life and growth of the tree.

Staff organization is a division according to functions—division by which one military department does all the engineering work for the whole army, another supplies all clothing, or rations, etc. It is the division by which the roots absorb moisture and salts from the earth, the leaf cells make chlorophyll, the sap carries the products of these laboratories to the cell-building processes of the tree. Staff functions are co-ordinate and co-operative, but they do not stand to one another in any order of ascending and descending scale. The captain, simply as captain, ranks and commands the lieutenant; that is a line relation. But the engineer, as engineer, does not command the quarter-master; the quarter-master does not rank and command the surgeon; the leaf does not rank the root; that is a staff relation. On the other hand, the captain is primarily responsible only for his own company; each branch of the tree supports only its own twigs and each twig its own leaves. That, again, is line organization. The scope of the individual is limited in area, but unlimited in responsibility within that area. But the engineer builds a bridge for the entire army—general, colonels, captains, and privates; each root and leaf contributes its share to the life of the entire tree. That is staff organiza-

[1] Adapted by permission from C. B. Going, *Principles of Industrial Engineering*, pp. 41–44. (McGraw-Hill Book Company, 1911.)

tion. The responsibility of the individual is unlimited in area, but limited to one function throughout that area.

The functions of staff and line are, therefore, not antagonistic; they are not alternative and rival systems of organization, between which we may choose and say we will adopt this or that and refuse the other. Line organization is essential to discipline and essential to the continuous existence of the whole body. If the general retires there must be a colonel to succeed him; if the captain is killed in action, the lieutenant must take command of the company, or the men are scattered and lost. Staff organization is essential to efficiency, each branch of it in its own particular function. If the commissary fails and there is no food for the troops, the engineer cannot make up for the deficiency by vigorously building bridges. Each staff must have a line organization within itself for discipline and continuity; but every complete organization must embody the principles of both line and staff if we are to secure the best results, the staff supplying expert functional guidance, applied through the line's direct control.

In manufacturing and industrial operations generally there is no lack of development of line organization, but there is too often a very meagre appreciation of the valuable results attainable by far-reaching applications of the staff principle. This is generally characteristic of modern industrial concerns, and it is here that we are likely to discover weakness when the attainment of high efficiency is desired. Under line organization, the foreman is supposed to decide every question for the men under his particular control—employment or discharge, wages, jobs, difficulties with materials, difficulties with tools, difficulties with processes, difficulties with other employees. If the question is too big for the foreman he goes to the superintendent, and if it is too much for the superintendent he puts it to the general manager, and it may finally go to the board of directors. The assumption under-lying is akin to the supposition that the corporal must be a better shot than the private, and the sergeant than the corporal, and the lieutenant than the sergeant, and so on up to the general in command.

B. THE UNIT SYSTEM[1]

An interesting concrete example of modern scientific organization is furnished by the most extensive railway system in the world, the Union Pacific System-Southern Pacific Company, popularly known as the Harriman Lines.

[1] Adapted by permission from C. D. Hine, *Modern Organization*, pp. 14–33. (The Engineering Magazine Company, 1912.)

As a result of studies and recommendations made by the writer in 1908 under the direction of Mr. Kruttschnitt, there has been inaugurated a unit system of operating organization. The working outline of this organization can best be understood from the following standard forms of official circulars by which it is promulgated:

.....Rail..... Company

OFFICE OF GENERAL MANAGER

Circular No.....

.....191..

The following appointments of Assistant General Managers are announced, effective

....., 191...:

1. Mr..... 2. Mr..... 3. Mr.....
4. Mr..... 5. Mr..... 6. Mr.....
7. Mr..... 8. Mr.....

Each of the above named officials continues charged with the responsibilities heretofore devolving upon him and in addition assumes such other duties as may from time to time be assigned.

The titles, "General Superintendent," "Superintendent of Motive Power," "Chief Engineer," "Superintendent of Transportation," "General Store-keeper," "Superintendent of Telegraph," and "Superintendent of Dining Cars," will be retained by the present holders or their successors to such extent only as may be necessary for a proper compliance with laws and existing contracts.

All persons under the jurisdiction of this office will address reports and communications, including replies, intended for the General Manager or for any Assistant General Manager, simply: "Assistant General Manager" (Company telegrams "A. G. M."), no name being used unless intended as personal or confidential, or to reach an official away from his headquarters.

It is intended that an Assistant General Manager shall be in charge of this office during office hours. Each official transacts business in his own name and no person should sign the name or initials of another.

All persons outside the jurisdiction of this office are requested to address communications, including replies, intended for the General Manager or for any Assistant General Manager, simply: "General Manager.....
.....Co. .....Bldg.
....," no name being used unless

intended as personal or confidential or to reach an official away from his headquarters.

.....
General Manager

Approved:

.....
Vice-President

.....Division

OFFICE OF SUPERINTENDENT

Circular No.....

.....191..

Effective this date, this Division discontinues among its officials the use of the titles, Master Mechanic, Division Engineer, Trainmaster, Traveling Engineer and Chief Dispatcher.

The following named officials are designated:

1. Mr. A. B.....Assistant Superintendent
2. Mr. C. D.....Assistant Superintendent
3. Mr. E. F.....Assistant Superintendent
4. Mr. G. H.....Assistant Superintendent
5. Mr. I. K.....Assistant Superintendent
6. Mr. L. M.....Assistant Superintendent

They will be obeyed and respected accordingly.

Each of the above named officials continues charged with the responsibilities heretofore devolving upon him, and in addition assumes such other duties as may from time to time be assigned.

All of the above will be located in the same building with one consolidated office file in common with the Superintendent.

All reports and communications on the Company's business, originating on this division, intended for the Superintendent or for any Assistant Superintendent should be addressed simply "Assistant Superintendent" (telegrams "A. S."), no name being used unless the communication is intended to reach an official away from his headquarters, or to be personal rather than official, in which latter case it will be held unopened for the person addressed. It is intended that an Assistant Superintendent shall always be on duty in charge of the division headquarters offices during office hours. The designation of a particular Assistant Superintendent to handle specified classes of correspondence and telegrams is a matter concerning only this office. Each official transacts business in his own name, and no person should sign the name or initials of another. The principle

to guide subordinate officials and employees is to be governed by the latest instructions issued and received.

Train orders will be given over the initials of the Train Dispatcher on duty, as will messages originated by him.

Officials and other persons above and outside the jurisdiction of this division are requested to address official communications, intended for the Superintendent or for any Assistant Superintendent, simply: "Superintendent..... Division....." (telegrams "Supt."), without using the name of the Superintendent except for personal matter.

.....

Approved: Superintendent

.....

General Manager

Any study of the underlying principles of the unit system must take into account a most distinctive characteristic of a railway, namely, its physical extent. The head of a manufacturing plant, of a bank, or of a department store, could in a few hours' time personally see every employee of the establishment and observe most of the constituent activities. After a railway once begins business no division superintendent even can hope ever to see all of his trains assembled or all of his employees congregated in one place. So few can come to him that he must go to them. This results in an anomalous condition. While the superintendent or other official is on the road, the routine business at headquarters must be transacted or the company's interests will suffer. Under a feudal conception that because the superintendent is an official he can be in at least two places at the same time, it is the custom on most railways to have the chief clerk at headquarters sign the name of the absent superintendent to official communications. When the superintendent is absent from headquarters the chief clerk perforce handles communications to such subordinate officials as the master mechanic, the division engineer, the trainmaster, etc., officers all receiving larger salaries than the untitled chief clerk and presumably men of wider experience and better qualifications than he. Sooner or later every chief clerk oversteps the tenuous line and in the name of routine business is consciously or unconsciously restricting the authority or activity of those who are in reality his official superiors.

The unit system of organization eliminates "government by chief clerks" by insisting that no person shall sign the name or initials of another. Since the business must go on and no person may sign for another, it follows that a sufficient number of duly qualified

officers must be appointed By giving all the uniform title of assistant this or that, every one is available for prompt comprehensive action should occasion so require.

This requirement is worked out in practice by having normally at headquarters the senior assistant, who is in effect, though not in name, the chief of staff. At the headquarters of an operating division he is, as stated, the man who was previously to reorganization the assistant superintendent of the division. The former chief train dispatcher of the division is usually started near the foot of the list of assistants. His duties are unchanged and he remains at headquarters handling such endless details of operation as directing the work of train dispatchers and telegraph and telephone operators, assigning locomotives, distributing cars, manning trains; in fact, he is the incarnation of detailed administrative activity. At a normal division headquarters, then, there are two assistant superintendents on duty, one as chief of staff, the other as chief dispatcher, one the senior and the other a junior, one a distinct head of the office, the other in effect his senior's aide. Both assistants being clothed with authority, either can act on any problem that may suddenly develop in an unforeseen absence of the other. On divisions of very light traffic one assistant at headquarters may be sufficient.

No distinct grade of senior or chief assistant is created in any unit. Normally number one, the real senior, is "on the lid," as it is termed, at headquarters, and is excused from outside road duties. In case of his prolonged absence, the head of the unit, the general manager, or the superintendent, as the case may be, designates the most available of the other assistants to remain at headquarters and sit on the lid. An unwritten law here operates to make such designated assistant the chief or senior of all the others for the time being. No formal announcement of such designation is necessary. A railroad does not change its physical location frequently, as does a fleet or an army, and the chance of confusion of relative rank is remote. Advantage is taken of this elastic feature of assignment on some divisions to rotate various assistants through the senior chair in order to gain the splendid comprehensive training for higher positions which the position affords. Assistants thus favored are unanimous in expressions of appreciation for the valuable knowledge and experience acquired.

Each assistant when at headquarters signs communications to subordinates in that branch of work in which he is technically

expert and for which he is held responsible by the head of the unit. For example, the maintenance assistant superintendent issues instructions to his roadmasters or track supervisors; the mechanical assistant to his engine-house foreman or car-repair foreman; the transportation assistant to his yardmasters, etc., etc. Each, however, after signing is supposed to send his communication over the desk of the senior assistant, both for the latter's information and for review and co-ordination. This has proved a valuable check upon official caprice in issuing unnecessary instructions. More energy is now expended in seeing that instructions already issued are carried out, and less in promulgating those that in themselves may unconsciously confess a laxity in previous enforcement. It is obvious that under this system the senior assistant has a most comprehensive knowledge of the affairs of the unit. The head and the other assistants come and go between the road and the office. The senior assistant has a practical grasp of operation that enables him to aid the head of the unit in balancing its component elements, in minimizing departmental jealousies, and in engendering a spirit of team work.

When the head of the unit or any assistant is on the road, he is represented at headquarters not by a chief clerk but by a chief of staff, the senior assistant, who transacts business in his own name. This somewhat elaborate covering of headquarters results, as intended, in more traveling and in better outside supervision by the other assistants. Their increased availability for outside work is the strongest of the several strong features of the system.

C. THE COMMITTEE SYSTEM[1]

Committees in general.— Factory problems are nearly always many sided and hence difficult of solution by any one man, especially where, under staff organization, he is charged with and capable of handling only one phase of the work. Furthermore, as before stated, when several men are on the same authoritative level there must always be some definite means provided so that they can harmonize their efforts. There is no way by which these ends can be served comparable with a good committee system. There are several inherent advantages in a good committee. First, it is impersonal in its action, and its verdict, like that of any jury, is usually based on the facts presented. The very atmosphere of a committee tends to compel all of its members to lay aside pettiness and personal prejudice and to act in accordance with the merits of the case. The

[1] Taken by permission from D. S. Kimball, *Principles of Industrial Organization*, pp. 88–91. (McGraw-Hill Book Company, 1913.)

foreman who would, over the telephone, blame a fellow-foreman for a delay will hesitate to do so in his presence or in that of his superior officers. The decisions of a committee are, therefore, likely to be more accurate than those of an individual because of the greater accuracy of its basic information. A misstatement on the part of a member is not likely to go unchallenged.

Secondly, committee meetings tend to promote a better understanding between men of the same authoritative level and of different levels. Distrust and jealousy of each other are rapidly eliminated as men know one another better and see the good side of each other's nature. There is something likable in all men if one can succeed in discovering it, and this can be done only by bringing them into close personal contact with common problems to be solved, not by wrangling and fault-finding, but by an earnest endeavor to find the very best solution. Thirdly, the committee method tends to awaken interest in the work and to draw out the best efforts of all of its members, and tends generally toward a better *esprit de corps*.

Committees are always of an advisory character. They cannot replace strong personality but they can be used effectively to assist a strong executive in finding out what is actually going on in the factory, in deciding what should be done, and in enlisting the good will of those under him. The best and most natural basis of committee work is a report on the matter under discussion, and reports are greatly enhanced in value when discussed by an intelligent and representative committee. There may be many kinds of committees and for many purposes, but only a few typical ones will be discussed here. In general, committees should not be too large or too small. If too large they become very unwieldy, and if too small they may not secure a broad representation. A committee of six members is usually large enough.

The manufacturing committee.—Referring to Figure 4 [omitted] it is apparent that no one of the four vice-presidents [chief salesman, chief engineer, factory manager, and treasurer] would be able, in general, to advise the general manager on the entire manufacturing policy of the works. But if these four men are collected into a manufacturing committee, each of the four important divisions of the works is represented by an expert. The general manager would be the natural chairman and such a committee, through him, can direct the manufacturing policy of the plant with great intelligence. The matters that naturally come before this committee are:

1. The general manufacturing policy of the plant, the character and sizes of the articles to be made.

2. The approval of all orders of extraordinary character and the approval of orders for stock, if goods are manufactured for stock. The approval of all extraordinary manufacturing expenditures and recommendations for economies.

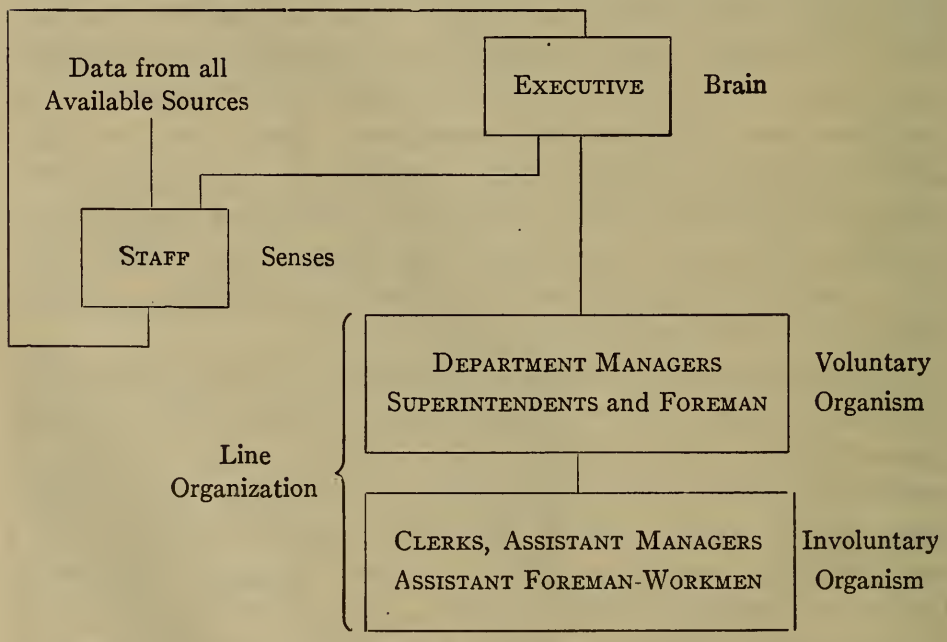
The reports that would naturally be laid before it would, therefore, include the profit and loss statement, stock and sales reports, and similar general statements.

[The original continues with a discussion of various committees. That discussion is here omitted and the reader is referred to pages 236–239 for other examples of committee organization.]

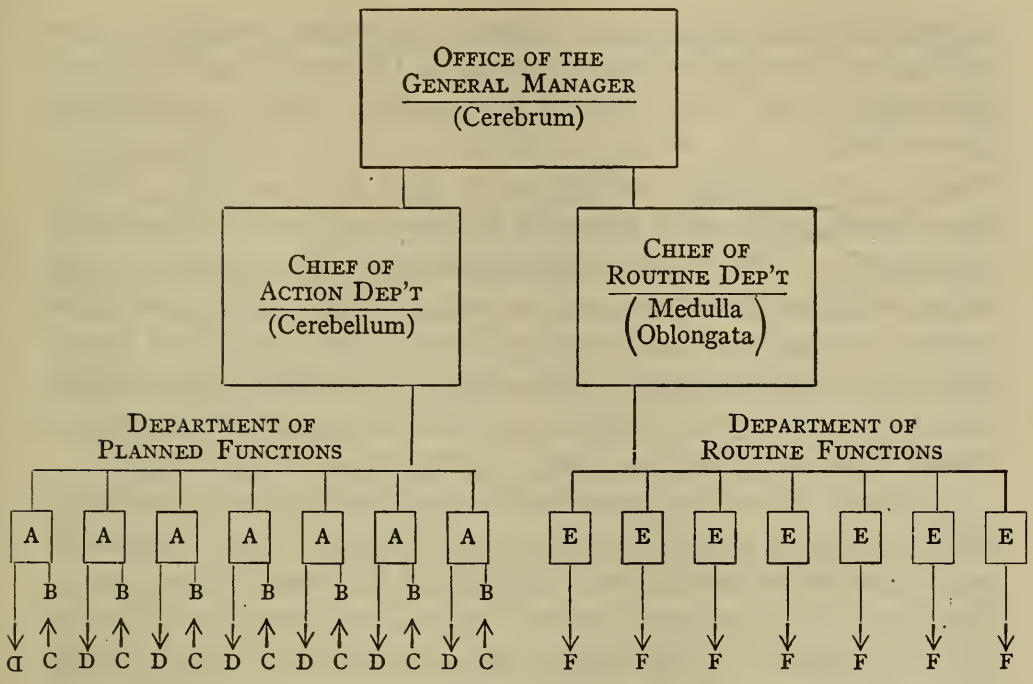
D. THE HUMAN ANALOGY[1]

The Master Designer of the universe brought into being the highest development of his handicraft, the human body—the most perfect type of organization. So perfect was this organization in its inception, so flawless in its functioning under the severest conditions, that not in the slightest detail, has a change been made since its organization. We little realize what an efficiently managed and complicated manufacturing plant we possess built upon that frame-

BUSINESS ORGANIZATION MODELED FROM HUMAN ORGANISM



[1] Adapted by permission from an advertisement by C. E. Knoeppel and Company in *Industrial Management* for November, 1918. See also article by J. H. Van Deventer in *Industrial Management*, LX (1920), 260–64.



A—Action-department managers.
B—Information experts assisting the above.
C—Incoming information (sensations).
D—Outgoing orders to the working force (muscles).
E—Routine-department managers.
F—Outgoing orders to the working force (involuntary muscles).

Notice that the action-department managers are provided with assistants to relieve the arduous and varied efforts they are called upon to make, whereas the routine department managers, not being under the strain of original work, are required to perform their duties without assistance. Compare this with the organization scheme of your plant.

work of bones; and in a still lesser degree do we realize how the complex system of the body is so admirably controlled under the scientific management of the brain and nervous system. A better example of organized control cannot be found anywhere in the whole wide world; its component parts are of a finer kind of design than we will ever approximate, and the functions and their relations are co-ordinated more smoothly than we will ever be able to arrange human relations. Every function of the body is a skilled function, doing something it has been fitted to do.

First, we have the cerebrum, or office of the general manager. As befits the dignity of its position its location is at the very top. It is the center of intelligence, thought, reason, judgment. Directly

beneath it is the cerebellum, or office of the action manager. Controlling as it does the voluntary muscles of the body, it is the responsible party for all of our physical movements. Directly underneath the cerebellum is the medulla, in which is located the chief of routine affairs, a very important official as we shall later find out. These three constitute the main officers of the company, but each has many subordinates. The spinal column constitutes the connecting link of authority between these various under officials. By it the reflex centers, or department managers, are kept in touch with their immediate head, the cerebellum. Also, through its agency, the routine department managers, otherwise called the sympathetic ganglia, answer to the commands of their superior, the medulla oblongata.

Each of the action department managers has two subordinate officials working under his orders, one of which is the information expert who records and collects information in the way of sensations; the other is the gang boss or action department foreman, who carries out the orders of his department manager which are based on the information received from the information expert. Physiologists call the information expert and the gang boss by different names—the sensory and the motor nerves. Their functions are kept quite as distinct as those of the functional foremen in what is known as scientific management. In addition to these, there are a number of very highly specialized and high-priced officials who look after extremely important divisions of work. As a group they are called the cranial nerves, and among them are the heads of the optical, auditory, and the other sensory departments.

We see from the above that the type of management of this model plant is strictly a line and staff organization, carried out to a finer degree than any of us are accustomed to. There is evidently no sparing of specialists where they are needed, and the duty strongly impressed on each of these is to take full charge of his job and leave the general manager free to think of the big thoughts.

E. THE "TWO-PLANE" PLAN OF ORGANIZATION[1]

This form of organization—precisely as the human brain does the thinking and the nervous system takes care of routine—separates creative from routine functions and provides a duplex organization, the creative part of which does the orginal thinking. It has time to

[1] Adapted by permission from J. H. Van Deventer, "How to Develop Executive Ability," *Industrial Management*, LX (1920), 260–64.

do it because it is free from routine. The creative part of this organization continually breaks new ground, and its findings and discoveries, when approved and adopted, are passed over to the corresponding routine plane.

The chief value of the "two-plane" organization plan lies in compelling an analysis of the business from a new point of view which leads to the encouragement of proper routine with the liberation of detail from the creative minds. Routine keeps the ship of industry afloat, but creative thought is the motive power that gives it headway. The development of both of these two distinctively different classes of activity is essential to the attainment of the fullest degree of success.

The creative plane in any organization cannot be properly developed without a corresponding development of the routine plane. Too much steam and too little flywheel is a fatal combination; much less safe than the reverse condition. Perfect the routine first, for it is the backbone of the business. This is the plane for the substantial level-headed fellows gifted with persistency and for temperaments lacking imagination and happiest under the cross fire of intense activity.

For the creative plane the qualifications are: a broad knowledge of the policy of the organization as a whole; an intimate knowledge of the particular requirements of the department or division; unlimited enthusiasm and the gift of imagination. [The author gives an excellent diagram of an organization planned on the "two-plane" basis. The following will serve as samples—they are only samples—of the entire scheme.]

PRESIDENT'S POSITION

Creative plane.—President formulates company policies through consultation with his staff; critically analyzes reports from all divisions prepared by his assistants; consciously directs the development of enthusiasm and efficiency of all division heads; interprets through his personality, actions, and contact with employees the spirit of the organization; makes critical study of the weak points in the organization and initiates steps to strengthen them.

Routine plane.—Assistant to president receives routine reports from every division and prepares final digest of these for president's attention; maintains schedule of appointments, disposing of unnecessary interviews personally or by delegation; maintains the executive correspondence and data files; acts as secretary at staff conferences

and maintains follow-up of decisions therein arrived at; prepares bulk of correspondence for president's signature, either on own initiative or under brief instructions.

SALES POSITION

Creative plane.—Vice-president in charge of sales studies the possibilities of new markets; instigates sales campaigns; investigates serious difficulties of sales resistance; interprets further possibilities of product through the analysis of performance data; creates new sales arguments; develops the sales force and establishes and develops the dealer and distribution organization.

Routine plane.—Assistant to vice-president tabulates daily sales report; prepares sales analyses and records of increase; maintains follow-up; supervises sales correspondence and general routine of business with dealer and distributor; supervises circulation of form letters and the preparation and maintenance of mailing lists; responsible for the proper maintenance of all routine in connection with the sales organization.

FINANCIAL POSITION

Creative plane.—Vice-president and treasurer establishes and modifies general financial policy with approval of the president and board of directors; supervises bond and stock issues, loans, investments; makes critical study of costs and profits.

Routine plane.—Assistant to vice-president and treasurer analyzes market conditions and trend of business; prepares graphical and statistical financial reports; compiles credit data; operates accounting department; manages cashier and paymaster's offices; checks purchases; maintains cash accounts; compiles regular daily reports for president and treasurer; makes final tabulation of cost data based on factory costs.

For the Taylor plan, frequently called functional organization,

See p. 615. Scientific Management in Production.
p. 624. Control of Manufacture under the Taylor System.
p. 354. An Organization of the Sales Department.

5. "REGULATIVE PRINCIPLES" OF THE ART OF MANAGEMENT[1]

No apology is necessary for an attempt to formulate some definite basis on which to build a truly scientific art of management. The regulative principles of the art of management are three:

1. The systematic use of experience.
2. The economic control of effort.
3. The promotion of personal effectiveness.

If these three principles are correctly stated, then the scientific basis of management is capable of being derived from their development and extension.

1. *The first principle: The systematic use of experience.*—Experience is the knowledge of past attainment. It includes a knowledge of what has been done, and also how it has been done. It is inseparably associated with standards of performance, that is, with the ideas of quantity and quality in relation to any particular method of doing something.

The great instrument of experience, which makes progress possible, is "comparison." By systematic use of experience is meant the careful analysis of what is about to be attempted and its reference to existing records and standards of performance. In many cases it may be found that gaps in existing experience occur. In such cases the experimental determination of data may be undertaken, so that we have a full covering of the ground, either by the experience of others or from our own experimental determinations.

In setting out to examine any work it is necessary to ask:

What experience, in the form of methods and standards of performance, already exist?

Is our performance equal to these standards?

Is it so far behind that it will pay to expend time, energy, and money to approximate more nearly?

Are existing standards based upon the use of the most advanced practices and methods of the present day, or is there reason to suppose that experimental redetermination of such standards would show a new maximum of effectiveness?

In the experimental accumulation of experience the economic value of such experience must be kept in view. If the inquiry

[1] Adapted by permission from A. H. Church and L. P. Alford, "The Principles of Management," in *American Machinist*, XXXVI (1912), 857–61; and A. H. Church, *The Science and Practice of Management*, p. 111. (The Engineering Magazine Company, 1914.)

relates to operations which will be repeated many times, as in the processes of manufacturing staple articles, detailed experimental investigation may be worth while. In other cases it is well to consider the total economic value involved, the possible maximum that could be saved, and the probable cost of the investigation.

Experience tends to pass into traditional practice. That is its most useful form. Every kind of experience must pass into the mind of a man before it can be utilized practically; hence it follows that new experience should be crystallized into new traditions of practice as fast as possible.

In the shop men are not always running to textbooks to see if they are right—at least the competent practical man is not. Even if it be conceded that practice in the present day is all wrong and needs to undergo exhaustive study and reform, this only means that we are engaged in developing new standards of practice, which will take the place of the old traditional practice, and will in turn form a new tradition. The proper place for these new traditions or standards of practice is precisely the same place as where the old ones were kept, namely, in the minds and memories of those who do and are responsible for doing the work. Further, it is impossible to record it all—something must remain with the man.

New experience can be transmitted in one of two ways, either in minute instructions of which individual workers do not perceive the drift, or as a connected body of new practice. The latter form is the better, though it demands educational efforts somewhat apart from ordinary shop routine. Not until the new experience has become fixed as a habit will its full value be realized.

2. *The second principle: The economic control of effort.*—Effort is experience in action. Before we can do we must think, that is, dig into our stores of experience relative to the proposed undertaking. Having taken thought, we proceed to action.

In order to produce organized action it is necessary to control effort in various ways. These are: "division," "co-ordination," "conservation," and—in industrial undertakings—"remuneration." Most of the discussions about management are, in fact, discussions about the various methods and degrees of controlling effort and fixing its reward.

It is possible to manipulate effort so as to produce an organization of the utmost flexibility or, on the other hand, one of hard and fast rigidity. In certain special cases rigid organization is permissible,

but in general manufacturing, flexibility is really essential. By flexibility is meant the power of self-adjustment to unforeseen events.

Division of effort.—Division of effort is largely controlled by design. This is the principle of the unit part or component. Modern practice regards the complete machine or device as an aggregation of parts, and it is one test of efficiency when these parts come together in perfect shape, without requiring readjustment to correct faults of workmanship in their progress through the shops.

"Division of effort" is a universal principle throughout all the activities of manufacturing. Starting with design which controls the maximum limit of operative division, it is usually found desirable that operation should also be divided into processes. These usually correspond to machines. To some extent they are controlled by "settings."

It is important to have as few settings as possible, as nothing else is so wasteful of time. One setting in a jig is, therefore, made to subserve several processes in some cases. In other cases one setting in a machine holds the work for a series of consecutive processes, which may be of a different character, as turning, boring, threading, etc., at one setting.

From this it is apparent that there are limiting considerations to the division of effort. It is not merely a question of dividing to the bitter end. There are cases in which it is better to combine operations and, in fact, execute them simultaneously.

This is worthy of attention, because it will be found that in all the principles of management that have yet been ascertained the limiting conditions are not yet formulated. Every such principle has limitations and it is neither necessary nor advisable to push it to its farthest possible development. For example, the provision of jigs for repetition work and where it is required to secure dimensional relations of exactness, as in drilling holes, though a very old idea, has not yet been definitely settled as regards its limiting conditions, and there are frequent cases in which doubt exists whether the expenditure for such jigs was, after all, a wise one.

By many of the enthusiastic advocates of particular systems of management, the existence of limiting conditions is hardly suspected, consequently they ride their favorite hobby to exhaustion, till many useful ideas become discredited in the eyes of practical men. It is not enough to know that a principle can be applied—it is even more important to know when not to apply it.

The third great field of division of effort is in connection with administration or control. This is the great battleground of the systems at the present moment. Thus, to mention only two, we have Taylor's functional system and Emerson's line-and-staff plan. Also we have the old method of simple, delegated authority in hierarchical form, from president to manager, manager to superintendent, superintendent to foreman and so on. Which is the best?

Obviously, the question cannot be answered until we have ascertained what principles have been applied in each case to produce these forms of organization, and what are the limiting conditions that control, or should control, them. The subject is a tempting one, but it must be postponed until, at least, the remaining modes of manipulating effort have received attention.

Co-ordination of effort.—The co-ordination of effort is an inseparable counterpart of the division of effort. By co-ordination is meant the prearrangement of a number of separate efforts in such a manner as to produce a definite end. A still more perfect co-ordination is attempted when this end is to be attained in a definite time. Co-ordination in design means that unit parts are so designed that ultimately they fit together. Co-ordination in division of operations means that when all the operations are performed, certain definite shape and dimension are given to the part. Both kinds of co-ordination are part of everyday practice, and are generally realized with a good percentage of success. Co-ordination of operations in regard to time is, however, a more advanced matter, and in many plants is still in a very unsatisfactory stage.

The co-ordination of administrative effort is the most complex and debatable problem of all. The moment we begin to divide effort, we must also begin to provide for its co-ordination. Administrative effort does not possess the same tangibility or definiteness as do design and operation, because it is wholly made up of spheres of influence of personal authority.

Therefore, in proportion as we divide administrative effort (executive functions), its co-ordination becomes more difficult. The more we subdivide authority, the less flexible becomes our organization.

There is a point midway between simple delegation of all authority and the method of analyzing it into component functions and handing out each of these functions to separate many that is probably the most effective way of dividing administrative effort. The

limiting conditions to excessive functionalism can, however, already be seen as shown above.

Conservation of effort.—Effort requires not only to be divided and co-ordinated but also conserved. The conservation of effort means proceeding along the line of least effort to attain a given end.

Remuneration of effort.—The remuneration of effort has very little relation to any of the other manipulations of effort, for these would still be necessary if no remuneration was offered at all. But as no plants are manned with staffs who work for the mere pleasure of working or "for their health," the question of remuneration is very important.

3. *The third principle: The promotion of personal effectiveness.*—The ideal plant is one which has good equipment, good methods, and good men. It is a comparatively modern discovery that the welfare of the plant and the welfare of its employees are closely connected. By welfare we do not mean, however, the semi-philanthropic ideals which result in model villages and other "social welfare" experiments, but only the application of the principle of the "square deal" to working relations during working hours.

The Latin poet defined happiness as the possession of a healthy mind in a healthy body. The definition is perhaps a somewhat pagan one, but eminently practical at that. If the plant cannot secure these gifts for its people, it can at least see that all conditions shall be favorable, or, at any rate, that they shall meet few conditions in their working hours inimical to either health of mind or body.

Remuneration stands, of course, at the head of these conditions, but it is not the only one, nor does it stand unconnected with others. In spite of Thomas Carlyle, the "cash nexus" is far from being the only link between employer and employee, even today—that is, if he is wise. In every considerable organization *esprit de corps* is always latent, and if it remains latent or is turned into latent, or open, discontent it is a mark of the very worst management.

Every human being desires to feel that his work is important. Even the criminal frequently has pride in his criminality. With certain kinds of creative work the mere doing of it is associated with a high degree of personal satisfaction, because the author or the artist is only following out the law of his being.

In proportion to the number of elements in a problem the difficulty of its solution augments. Personal effectiveness and its

favoring conditions contain innumerable elements, many of which probably defy human analysis. Therefore we must proceed modestly and cautiously on the path of discovery, and far from attempting to lay down the laws, it will be well if we succeed in observing the interplay of a few of the most obvious conditions of personal effectiveness.

To begin with, we must assume physical health. From this it is but a step to recognizing that shop conditions must be such that health can be conserved. This point is beginning to be understood, and modern shops avoid the dirt, darkness, and obscurity, and extremes of cold and heat that a generation ago were accepted as good business. We have progressed so far as to be aware that, on the contrary, they are very bad business. Closely allied is the question of affording facilities for personal cleanliness, dining halls for the midday meal, and other auxiliaries to physical needs of shop existence. The most widespread application of this third principle today is in the safeguarding of machines and operations.

The real center of the problem is, however, not on the physical plane, or only incidentally so. The psychological elements are not so obvious, but they are much more important. As in most of the analyses we have made, it is observable that these two groups are nearly independent of one another; that is, their efficiency can vary independently. We may have very bad physical conditions and yet a fine *esprit de corps* or, on the other hand, a finely arranged modern shop and a sullen, discontented population within its walls.

The independence is not quite complete, since bad physical conditions must affect the psychological side to some extent, even though not observable. But, on the other hand, the finest psychological adjustment will not make a dark shop light, or a cold shop warm.

Some of the conditions of personal effectiveness are these: The individual must feel leadership; have adequate encouragement and reward; be physically fit and under good physical conditions; and receive a definite allotment of responsibility.

These conditions apply not only to the operative force but to all grades of employees. In fact, some of them apply with greater urgency to the man "higher up" than to the actual worker. It is evident that they have, or should have, a considerable and controlling influence on the arrangements made for the division and coordination of administrative effort.

A good deal has been made by some of the modern schools of management doctrine of the claim that this or that system creates a fine spirit of co-operation between the plant and its men, but for the most part these claims are merely statements of a desirable end to be attained, and not indications of a method by which it can be attained.

The truth is, of course, that no single element of a system, or even a combination of half a dozen such elements, as methods of payment, functionalized authority, etc., more than touch the fringe of the question. Highly organized systems may coexist with fine *esprit de corps*, but the latter is not dependent on any form of system or organization.

Of all the conditions controlling a fine working atmosphere, leadership probably plays the most important part. In warfare men prefer to serve under the general who wins battles, though that entails hardships without number and toil without end. In industrialism, mechanism is a mighty unimportant thing compared with an "old man" who is a born leader of men.

The weakness of one prominent school of management doctrine is that it pretends that it has superseded leadership by substituting therefor elaborate mechanism. Such a contention betrays a complete misapprehension of how men are constituted, and of what the true functions of elaborate mechanism really are. All such mechanism is but a collection of mechanical tentacles or feelers, to enable the controlling mind and spirit of the management to be in several places at once. If the personality behind these tentacles is a feeble one, the mechanism will not supplement its deficiencies in the slightest degree.

This is not to say that such mechanism is useless; on the contrary, it is essential in the large-scale operations of modern industry, and it is, therefore, highly important that it should be carefully arranged and well balanced, but it is in itself inert and lifeless—a purely passive channel through which the capacities of leadership may exert themselves.

In other words, organization and system are something forced on us by the necessities of the case, and that something has no virtue either in itself, or in any possible combination of its components. It does not add one single cubit to the stature of leadership, though, on the other hand, its absence or its bad arrangement may detract considerably from the full realization of what would otherwise be possible to leadership.

It is more than probable that types of organization depend for their success on their harmony with the particular type of leadership that is endeavoring to make use of them. This would explain why systems are successful in one case and fall down in what appears a similar case.

At the present stage of the analysis of management we can do no more than make a note of this. It must always be remembered, however, that organization is a tool, and that it is our duty to fit it to the leader and not try to compress the leader to fit the system. Understanding of the limiting conditions of this part of the problem must be left to future progress to compass.

Recapitulation:

1. Experience must be systematically accumulated, standardized, and applied.
2. Effort must be economically regulated:
   a) It must be divided.
   b) It must be co-ordinated.
   c) It must be conserved.
   d) It must be remunerated.
3. Personal effectiveness must be promoted:
   a) Good physical conditions and environment must be maintained.
   b) The vocation, task, or duty should be analyzed to determine the special human faculty concerned.
   c) Tests should be applied to determine in what degree candidates possess special faculty.
   d) Habit should be formed on standardized bases, old or new.
   e) *Esprit de corps* must be fostered.
   f) Incentive must be proportioned to effort expected.

It may be interesting to subjoin here a brief comparison of the chief principles put forward by Taylor and Emerson, and show their place in relation to this tentative attempt to formulate the fundamental and constructive principles of management.

Mr. Taylor's principles.—Mr. Taylor's "scientific management" is a collection of axioms and an arbitrary combination of specific mechanisms rather than a body of principles. Among its leading features, time-study, functional foremanship, standardization, planning in advance, and task-bonus may be selected as characteristic.

The place of time-study is obviously under the first principle, namely, the systematic use of experience. It is a tool for supple-

menting and extending our experience, and its economic limitations have been discussed under that heading. Functional foremanship is related to the principle of the economic control of effort, and particularly to the division of administrative effort.

Standardization belongs to the same principle, and its particular niche is under the head of conservation of effort, in an avoidance of complexity where uniformity and simplicity can be maintained. In reforming old industries, standardization usually means cutting down, but in new industries it means the avoidance of unnecessary kinds, sizes, and methods. It means building up along the lines of least effort—either result flowing readily from acceptance of the sub-principle of the conservation of effort.

Planning in advance is largely an application of the co-ordination of effort. A certain amount of planning is inherent in every established routine, because the very idea of division of effort necessarily implies some measure of co-ordination. The necessity for preserving flexibility acts as a limiting condition to planning too elaborated and intensive.

Task-bonus is, of course, a special variety of application of remuneration of effort. Its value as a practical device must rest upon the degree to which it actually promotes personal effectiveness. It is one of many methods of remuneration, but the conditions to which this and the other methods apply in the most effective degree have not yet been studied and compared in any serious way.

One more point of Taylor's system may be mentioned. It is his claim that the science which underlies each act of each workman is so great that no workman is able to fully understand it (and presumably give it effect) without specific and very detailed guidance from above. This point has been covered by what has already been said on the subject of forming new traditions and habits based on the new knowledge that recent progress has given rise to.

This is obviously a case of applied systematic experience. If Mr. Taylor had in mind the use of his slide-rules in making this claim, then it is obvious that the use of such slide-rules, where they are useful, should become as much a part of the man's working habit as is the use of shifting gears or other devices for controlling the working of the machine.

Mr. Emerson's principles.—Emerson's twelve principles will not detain us long. His first principle, "clearly defined ideals," is not especially an industrial principle. It is presupposed that a man

knows what he wants or he can do nothing successfully. It certainly comes, however, under the head of systematic use of experience, if we try to apply it practically. His second principle, "common sense," is hardly a principle at all. It is simply one of the basic conditions of all successful human endeavor, and might be ranked with "sound judgment," "perseverance," and other moral and mental attributes. It is not especially industrial.

His third principle, "competent counsel," must also be ranged under the systematic use of experience. It means from those best qualified to provide it. His fourth principle, "discipline," comes under the division of administrative effort.

One of the prime functions of administration is to secure discipline, that is, to prevent irregular activities which are not co-ordinated with the useful activities necessary to the work. Idleness, absence, disregard of instructions are examples of unco-ordinated, and therefore harmful effort.

The fifth principle enunciated by Mr. Emerson is "the fair deal." This is a psychological matter belonging to the promotion of personal effectiveness. His sixth principle, "reliable and immediate records," is, of course, the function of comparison spoken of, though not the whole of it. The seventh principle, "dispatching," comes under, and in fact is, the practical mechanism of the co-ordination of effort. The eighth, ninth, and tenth principles, "standards and schedules," "standardized conditions," and "standardized operations," have been discussed under the Taylor system; so with the eleventh, "standard-practice instructions."

In these four cases standardization means conformity with the principle of conservation of effort, while standard-practice instructions are a part of planning, and therefore of co-ordination, of effort. Finally we have the twelfth principle given by Mr. Emerson, namely, "efficiency reward," which is simply another phrase for "remuneration of effort."

These illustrations have been made to demonstrate that as far as can be seen at present the three fundamental principles formulated in this paper, with their derivatives, do actually find a place for all divisions which modern analysis of industrial working has brought to light.

The important point is, of course, that by stating and fixing what are believed to be the three basic and fundamental principles of industrial activity, and deriving the subordinate details from these

in logical order, a beginning has been made toward finding a truly scientific basis for the art of management, on which all its prime facts can be built up, later, into a coherent and understandable system of theory and practice.

6. MEASURING AND COMMUNICATING AIDS OF CONTROL

A. STATISTICAL REPORTS FOR THE CHIEF EXECUTIVE

I[1]

The principal objectives of the use of statistics in business are:

1. To ascertain inner, controlling, master facts which cannot be ascertained by casual observation of the complex mass of obvious facts which constitute the experience of the business and in which they are contained. The sales manager about to undertake a sales campaign, does not trust to chance or to casual observation more than is necessary. He investigates and analyzes characteristics of the consuming public in a market—estimates among other things their probable demand for and capacity to purchase the particular commodity he proposes to introduce and the kind of advertising methods to which the purchasers of that market are most likely to react. The utility corporation analyzes statistically a growing suburb before it determines its policy of extension and capital investment. The merchandise and credit managers of a wholesale distributing house estimate the purchasing power of a region, through the statistical analysis of crop and other governing conditions, before determining policy with respect to a season's business. The manager of a retail store may analyze sales of different articles by sizes, seasons, etc., in order to determine a quality, quantity, and seasonal schedule of purchases, thereby adjusting orders to probable turnover.

2. To determine standards by which to value and guide *current* performance and in terms of which to estimate future performance. The merchandise manager of a department store receives each morning a summary sheet showing sales of the preceding day compared with sales of the same day the year before; cumulative sales of the month to date compared with cumulative sales of the corresponding period of the year before and with estimates for the current month;

[1] Adapted by permission from H. S. Person, "Statistical Control, Including Costs as a Factor in Production," *The Annals of the American Academy of Political and Social Science*, LXXXV (1919), 144–46.

cumulative sales of the year to date compared with those of the corresponding year before, and so on. He can ascertain at a glance whether sales are going well; if they are not he may institute at once a special sales campaign—likewise any business selling commodities or services. A production manager time-studies operations under different conditions and with different materials and methods, and by statistical treatment of the data establishes several standards—standards of conditions, of materials, of methods, of performance. He can then value and guide current performance and can estimate with precision future performance. He may keep his record in terms of units of output and in terms of units of cost. Cost units are no different from other units in statistical treatment. A telephone company analyzes statistical records of calls and establishes a standard of performance for an operator or for a system and on the basis of these standards can determine whether an operator is efficient or a system is approaching the volume of business for which it will be inadequate, requiring extension or replacement. The electric light or telephone or other similar company by statistical records determines the hours, the days, and other seasons when its various peak loads are bound to occur, and establishes operating policy accordingly.

The use of statistics in determining such standards for measuring current performance and estimating future performance is one of the latest developments of the use of statistics in business, offers one of the most profitable instruments for improvement in managerial methods, and unfortunately involves some of the greatest dangers of misuse. These misuses are prevalent in current practice. The first is the error of so organizing the function of recording, classifying, and analyzing data as to secure the returns too late for use in controlling *current* operations, in which case the statistics are but records of past performance and have so limited a usefulness as to raise the question whether they are worth the cost of collection. The second error is that the units of enumeration may not be homogeneous, and to the extent that they are not, their value in the control of current practice or of forecasting future performance is invalidated.

The third error in the use of statistics in establishing standards and measuring performance is that the units of statistical record may not correspond to the units of the operating processes. This is a common error, for only too frequently the statistical function is not recognized as a production function, and the statistical department and methods are developed independently of the production

department and methods. The analysis of processes by the production manager for the purposes of operating control is different from that of the statistical department for purposes of record, with the result that the statistics fail to be useful to the production manager. The same authority that approves the establishment of production methods should approve the establishment of statistical methods in so far as they are concerned with statistics of operation, in order to insure that the units of statistical record shall be identical with the unit process of production. Furthermore, the only way of assuring such correspondence is to make the "papers" which control production the original documents from which statistical data are drawn.

3. To establish a series of facts which suggest tendencies or permit comparisons which suggest causal relations, or at least correlation, between series. Time curves may be plotted showing sales—by salesmen, by territories, by articles, etc. By these the sales manager may keep informed concerning the sales tendency in a territory, of a commodity or of a salesman. Comparison of these curves may permit the manager to determine that the salesman whose record of gain is best is concentrating on leaders which yield small profit, while a salesman whose record for gain is not so good may be selling a wider variety of articles, thereby laying the foundation of a better long-run business in his territory. Curves of wages paid, hours of work, output per man, separations, hirings, cases of discipline, idle machine time, etc., may be compared and correlations proved—i.e., it may be observed that when one curve shows a particular tendency another shows a similar or different particular tendency. The establishment of such correlations permits more accurate forecasting of results and the establishment of more dependable policies. There is opportunity for the development of statistics of this kind in every business and the results may be considerable, but in no two businesses is it the same, and each is a field for special study.

There are many data pertaining to the social-industrial conditions in which a business is carried on, of importance to every manager in determining policy, but to collect, classify, and analyze these would be too great a burden of cost for one business. We have in mind data relating to crop conditions, prices of basic materials of industry, bank clearings, commercial failures, etc., which when consolidated and compared throw light on general business conditions. Statistics of this sort are now available through statistical service agencies, and it is not necessary for the individual business to secure them.

But there remains a considerable number of special "lines" of statistics, especially pertinent to its materials, products, and markets, which a business may profitably maintain.

4. To determine laws governing industrial operations. A comparison of different lines of statistics might disclose such relations as to prove principles to which the term "law" could properly be applied. Extraordinarily large numbers of homogeneous data are essential to the establishment of laws. These are seldom available in the records of a single industrial concern. The most noteworthy case of the scientifically precise observation, recording, classification, analysis, and general statistical treatment of industrial data which has led to the formulation of laws, was the study by Mr. Taylor and his associates which led to the discovery of the laws of metal-cutting, which revolutionized that art. The hope of the discovery of laws governing industrial operations depends upon the pooling of the statistical interests of many concerns—co-operative statistics which will yield homogeneous data in great volume.

See also p. 180. Wage Incentive: A Wage Formula.
p. 319. Some Phases of Market Analysis.

II[1]

In the first place, it must be recognized that the reports for the chief executive must be simple and condensed. Too many or too elaborate reports are as bad as no reports. In instances where a properly selected system of reports for the executive has not been worked out and a heterogeneous mass of reports is constantly supplied to him, it generally happens that many of the reports receive scant attention. The executive is too busy with other matters to spend his time in ploughing through a mass of details which could have been presented in summary form. He needs reports prepared especially for his purposes. If these summaries indicate the need of more detailed information from any department, it is always possible for the executive to secure the detailed reports and records from which the summaries were prepared. The summaries for the chief executive should enable him to detect irregularities which call for further explanation, and to judge tendencies affecting the business as a whole.

[1] Adapted by permission from M. T. Copeland, *Business Statistics*, pp. 551–54. (Harvard University Press, 1917.)

To the regular reports may be added summaries of the results of any casual tests or occasional experiments in which the executive is interested.

The following plan is outlined for purposes of illustration. A system of this sort would apply to a manufacturing company, such as a shoe factory, textile mill, or foundry, which is turning out standardized products. The same general scheme is applicable, with some modifications, to other manufacturing companies and an analogous scheme would apply to a mercantile business such as a wholesale house or a department store.

Daily reports: Orders (number and value), production (quantity), shipments (quantity or value), and delinquent deliveries (number and value). This last item is added because the mere fact that it is being constantly reported to the executive will tend to have a salutary effect upon the whole organization and help to keep the volume of delinquencies at a minimum. A daily record of the first three items should suffice to show the general tendencies of the business from day to day, at least so far as these tendencies are revealed by statistics.

Weekly reports: Total orders for the week, total orders to date (since beginning of season or year), unfilled orders, total production for week, total production to date, man-hours (total and percentage of normal) or machine-hours (total and percentage of normal), spoiled or second-grade product (quantity and percentage of total production). Two of these items, it is to be noted, are totals of daily figures. For comparative purposes it is ordinarily desirable to include with these weekly reports statistics for the total orders received during the corresponding week and the total orders to the same date in the preceding year. The production figures may likewise be compared with the corresponding figures for the preceding year, or, if a schedule has been worked out, with the schedule.

Monthly reports: Orders for each class of product (total for month, total to date), orders by sales districts (total for month, total to date, and comparison with quotas), returned goods, production by departments (total and percentage of normal), materials used (total for month and total to date), material on hand, stock in process (for these last three items figures should also be given to show the increase or decrease over the preceding month), and labor turn-over. For several of these items statistics should also be given for the corresponding period in the preceding year in order to facilitate comparisons.

The monthly reports should be presented in a form which enables the executive to compare the results for one month with those for preceding months. In many businesses, where the demand is seasonal, "peak loads" occur regularly in certain months and one of the problems which faces the executive is that of lessening the disturbing influence of peak loads upon his organization.

A set of reports such as is outlined above will give an executive a knowledge of the main facts about his business so far as they are represented by statistics. Many of these statistics, as a general rule, can advantageously be presented in graphic form. From these reports general tendencies should be revealed and irregularities detected. The reports should indicate whence more detailed statements can be obtained for each period.

B. ACCOUNTING AS AN ADMINISTRATIVE AID[1]

Assuming that the matter to be dealt with under the head of accounting has to do with the use of business reports, the next step is to consider from what various standpoints data need to be gathered and reports prepared. Who are the parties who are interested in the business, and what is the nature of their respective interests? The answer to this question may help to explain the great increase in demand for trained accountants which has made itself felt in the last few years.

It is not difficult to see that in a business organized as modern large-scale industry is organized, there will be need for reports for at least two purposes:

1. To furnish each one of the functional managers with information that will enable him to judge how well his subordinates were carrying out their duties, and to aid him in planning and carrying out his own duties in a successful manner.

2. To furnish the president or general manager with data that will enable him to judge of the success of the work of his subordinate managers and also enable him to determine the policy of the business as a whole and correlate the work of his subordinates in such a way as to carry out this policy consistently.

While the reporting for managerial purposes is the chief function of accounting, there are also other interested parties to whom reports must be submitted. The various parties who have investments in

[1] Adapted by permission from A. C. Hodge and J. O. McKinsey, *Principles of Accounting, passim* pp. 6–11. (The University of Chicago Press, 1920.)

the business desire to be able to judge of the profitableness of that investment and the desirability of continuing it or of adding to it. Also, it may be found desirable to interest additional investors and thus secure additional capital to extend the business and place it on a more profitable basis. The prospective investor would demand that information be furnished him to give him some idea of the condition and earning power of the business before he would risk his funds by investing them therein.

Another class which is keenly interested in the financial and operating health of the business enterprise is the creditors. There are two chief kinds of creditors besides the bondholders who have already been included among the investors, though strictly speaking they are really long-time creditors. The two kinds of short-time creditors are: (1) trade creditors, and (2) commercial banks. Both classes typically require reports setting forth the financial condition of the concerns which apply to them for credit. Some commercial credit agencies and many banks have standard forms upon which applicants for credit are required to make reports. The emphasis in these reports is somewhat different from that in reports to owners and long-time creditors like bondholders, but on the whole they usually contain about the same information as the latter. And neither type of report presents anything like as difficult a problem in accounting as the first class mentioned, namely, the reports for managerial purposes.

Such a business as we are discussing may also be of such importance, owing to its mere size, or to the nature of its product, that it involves a public interest in the way the business is carried on. There is nothing new or strange about this as applied to the so-called "utilities," such as the common carriers, the gas and electric companies, etc. In the case of these businesses it is recognized that the public is closely concerned and regulation is undertaken with the double purpose of making sure: (1) that the service rendered is adequate and satisfactory in quality, and (2) that it is rendered at a reasonable rate. It is easy to see that no regulatory body could hope to accomplish much along the lines indicated unless they were furnished with reports showing the amount of investment in the company in question, along with its earnings and expenses.

The necessity of reporting to government agencies is not confined to the utilities, however, but extends now to practically every business enterprise. The requirements of reporting for the purpose of

the income, excess profits, and war-profits taxes have practically forced even the most insignificant businesses into some sort of record-keeping.

To summarize our discussion with regard to the various parties interested in the modern business, and demanding reports prepared from the records kept in that business, we may indicate these interested parties as follows:

1. The managerial staff
   - *a*) President or general manager
   - *b*) Sales manager
   - *c*) Head merchandise man, or purchases manager (in a commercial business)
   - *d*) Factory superintendent or production manager (in a manufacturing business)
   - *e*) Comptroller or financial manager
   - *f*) Other functional managers, varying with the organization of the business
2. Investors, present and prospective
   - *a*) Stockholders, of various classes
   - *b*) Bondholders, also of various classes
3. The creditors
   - *a*) Trade creditors
   - *b*) Commercial banks
   - *c*) Other creditors
4. The government
   - *a*) For regulation of the price
   - *b*) For regulation of the quality
   - *c*) For purposes of taxation
   - *d*) For purposes of limitation on the amounts of certain materials and services that can be used
   - *e*) For the protection of those employed—regulation of hours, wages, working conditions, child labor, female labor, etc.

Given a certain type of business organization, with relations to investors, creditors, and the public, it is the accountant's task to determine what forms of reports will best serve the various purposes for which reports are needed, to ascertain what data will need to be gathered to serve as a basis for the preparation of these reports, to design a system of records which will facilitate the gathering and necessary analysis of this data, and finally to prepare from the data

thus gathered the reports and schedules determined upon. This task is not an insignificant or an easy one.

To prepare him for this task several things are necessary:

1. He must acquire some insight into the nature of the problems in the solution of which the business executive may reasonably expect aid from the accountant.

2. He must have some idea of the type of information desirable to aid in solving these problems and of forms of reports in which this information may be presented.

3. He must understand the analysis necessary to make available the desired information and the various possible bases upon which this analysis may be made.

4. He must learn how to design forms of records which will enable him to provide for the recording of individual business transactions, evidenced by various types of business papers involved, in such a way as to provide the analysis which has been decided upon as desirable.

See also p. 335. Measuring Aids Reflected in the Profit and Loss Statement.
p. 475. What the Balance Sheet Shows.
p. 482. What the Profit and Loss Statement Shows.
p. 595. Measuring and Communicating Aids: Cost Accounting.

C. BUDGETARY CONTROL[1]

The planning which may be done in connection with any business is of three kinds:

1. That which deals with the operations of the separate departments of the business, such as production, sales, and finance.

2. That which deals with the co-ordination of the operations of the several departments to the end that a well-formulated program may be made for the business as a whole.

3. That which deals with the determination of future conditions and the shaping of the plans of the business to meet these conditions.

The discussion in the following pages is restricted to planning of the second kind. Furthermore, it is restricted to a discussion of the more elementary principles of this method of planning.

[1] Adapted by permission from *Budgetary Control for Business*, pp. 1–17. Prepared under the direction of J. O. McKinsey. (Boston Chamber of Commerce, 1921.)

The procedure to be followed by a business firm in the installation and operation of budgetary control is very similar to that of a governmental unit. A possible procedure, stated briefly in outline form, is as follows:

1. Each department prepares an estimate of its "activities" for the budget period. How these activities are stated depends on the nature of the operations of the department. The sales department states the sales it expects to make and the estimated expenses it will incur in making these sales. The production department states the estimated production for the period and the estimated cost of this production. The "service" departments, such as the personnel department, the traffic department, the auditing department, and the office manager's department, state the estimated expenditures of their departments. Because of the interdependence of these departments, some will need to use the estimates of other departments in making their estimates. For instance, the production department must know the estimated sales before it can estimate the production necessary to meet the sales demands; the treasurer must know the plans of all the departments before he can estimate his cash receipts and cash disbursements. Consequently a procedure must be set up which provides for a proper schedule of the estimates with reference to preparation and distribution.

2. The departmental heads will transmit the departmental estimates to an executive who has supervision of the budgetary program. Sometimes the Comptroller acts in this capacity, while, in many cases, this duty is delegated to a member of the staff of the General Manager or President. This official combines the estimates of all the departments into a proposed budget for the business. This proposed budget should show the estimated receipts from all sources and the estimated expenditures by all departments of the business.

3. The official in charge of the budget program makes a comparison between the estimated revenues and the estimated expenditures as shown by the proposed budget. If the estimated expenditures exceed the estimated revenues, one of the following courses of action must be taken:

a) The departmental expenditures may be reduced. In making such reductions a problem arises which is not usually involved in the reducing of governmental expenditures, namely, the reduction of expenditures may result in a reduction of revenues. For instance, if the expenditures of the advertising department are reduced, this may

result in a reduction of sales. In the same manner, a reduction of the expenditures of the production department may result in a reduction of production with the consequent lack of sufficient goods to meet sales demands which will involve a reduction of revenue from sales. Care must be taken, therefore, in the reduction of expenditures to see that revenues are not reduced correspondingly.

b) Additional capital may be secured. If it is not deemed wise to reduce expenditures, plans must be made to secure additional capital with which to finance the excess of expenditures over revenues.

The officer in charge of the budgetary program may make recommendations with reference to possible procedure, but he is usually not invested with authority to determine the plans to be followed.

4. The proposed budget, as prepared by the officer in charge of the budgetary program, is submitted to an advisory committee, composed of the principal executives of the company and presided over by the President. This committee considers the proposed budget and makes such revisions as it thinks necessary. In case the proposed budget involves important changes in the company's policy, or involves significant plans of financing, it may be necessary to submit it to the Board of Directors for consideration. In some businesses all budgetary plans are submitted to the Board of Directors for approval. After the preliminary budget, as prepared by the executive in charge of the program has been approved, it constitutes the working program for the budget period. The budget, as adopted, sets limits upon the expenditures of all the departments. These limits cannot be exceeded without the permission of the Advisory Committee. The budget also sets up a standard of performance for certain departments. For instance, it states the sales that are to be made by the sales department and the goods which are to be produced by the production department.

5. Each department makes plans which will enable it to carry out its program as outlined under the budget. For instance, the advertising department makes contracts for advertising space; the sales department sets quotas for its salesmen; the production department through its planning department sets up schedules of production.

6. Proper records are established that the performance of each department may be properly recorded and comparisons made between the estimated and the actual performance. Periodic reports are made to the executive in charge of the budgetary program and are by him transmitted to the Advisory Committee, and in some cases to the Board of Directors, which show a comparison between the estimated

and the actual performance of each department for the period. Based on these reports, the Advisory Committee, or Board of Directors, may make such revisions of the budgetary program as it may deem desirable.

Budgetary control, if properly executed, accomplishes the following results:

1. Co-ordination of sales and production,[1] (*a*) by estimating sales possibilities and planning production to produce the goods necessary to meet these possibilities; (*b*) by limiting production to the amount necessary to meet probable sales demands as shown by the sales estimate and thus preventing an excess inventory of finished product.

2. The formulation of a profitable sales and production program. (*a*) By determining the lines of goods most desirable for a well-rounded sales program and adapting production, in so far as is consistent with (*b*) below, to produce the necessary quantity of these lines; (*b*) by determining the lines of goods most desirable for a well-rounded production program and planning sales, in so far as is consistent with (*a*) above, so as to sell the amount of these lines necessary to secure economical production.

3. Proper control of expenditures, (*a*) by requiring the preparation by each department head of an estimate of the expenditures of his department during the next budget period; (*b*) by requiring the submission of these estimates to the Advisory Committee (a committee composed of the chief executives of the business) for consideration and approval; (*c*) by the prohibition of any expenditures in excess of the departmental estimates without the permission of the Advisory Committee; (*d*) by requiring the submission of monthly reports showing a comparison between the actual expenditures for the month and the estimated.

4. Formulation of a financial program, (*a*) by the estimating of cash receipts based on the sales program and the estimate of collections; (*b*) by the estimating of cash disbursements based on the production, purchasing, plant and equipment, and departmental expense budgets; (*c*) by determining the excess of disbursements over receipts and the preparation of a financial program which will secure funds to provide for this excess.

5. Co-ordination of all the activities of the business, (*a*) by the preparation by each department of an estimate of its activities during

[1] The points here brought out with reference to co-ordination of sales and production in a manufacturing business apply as well to co-ordination of sales and purchases in a mercantile business.

the budget period; (*b*) by the studying of these departmental estimates by the departmental executives and the Advisory Committee; (*c*) by the modification of the activities of each department to the end that they co-ordinate with the activities of each other department; (*d*) by the preparation of an estimated balance sheet and an estimated statement of profit and loss showing the anticipated results of the operations provided for by the budgetary program; (*e*) by the formulation of plans and policies which will make possible the attainment of the estimated results as shown by the financial reports prepared in (*d*) above.

The scope of the budget program is indicated by the statement of its purpose. It includes all the activities of the business. It involves the following:

1. Preparation of an estimate of:[1] (*a*) sales, (*b*) purchases, (*c*) production, (*d*) labor cost, (*e*) manufacturing expense, (*f*) plant and equipment cost, (*g*) administrative expenses of each department, (*h*) selling expenses of each selling unit, (*i*) funds required to finance these estimates.

2. Co-ordination and approval of these estimates by a central authority.

3. Monthly reports making possible control and revision of the estimates as approved.

It is as essential that the limitations of budgetary control shall be understood as that the benefits which may be derived from it may be realized. These limitations may be stated as follows:

1. The budgetary program is based on estimates. Estimates cannot be made which are entirely accurate, and consequently they must be used with judgment and not followed arbitrarily. It is also necessary that provision be made for frequent revisions of these estimates as actual performance shows variations from the estimated performance.

2. Budgetary control cannot take the place of administration and management. It is not its purpose to deprive executives of the necessary freedom of action which is essential to progressive management. Its purpose is to provide the information on which administrative decisions and administrative control are based.

3. Budgetary control cannot be perfected immediately. The procedure called for by the budgetary program is usually new to

[1] The estimates suggested here are those required by a manufacturing business. The estimates for a mercantile business can be easily determined by analogy.

executives, and it takes time to train them to properly make and use estimates of future plans. Too much should not be expected at the beginning from the installation of budgetary control.

It is impossible to make any estimates or plans for budgetary control until the length of the budget period is determined. The length of the budget period is governed by a number of factors, the most important of which are, (*a*) the nature of the business with particular reference to the length of its turnover period, (*b*) the method of financing employed, (*c*) the market conditions, (*d*) the adequacy and completeness of the data with reference to past operations.

Before it is possible to proceed with the operation of a budgetary program, it is necessary to formulate an organization by which its operation will be effected. The budgetary program contemplates the co-ordination of the activities of all the departments into a program for the business as a whole. It is obvious that it is not desirable for this co-ordination to be undertaken by any one of the departments which is to be subject to the control exercised in its accomplishment. This responsibility must be vested in an authority which is independent of any department. Consequently control of all matters pertaining to the budgetary program is usually vested in the President of the Company. In most cases he delegates a considerable part of his authority to a staff assistant who has direct control of budgetary plans and procedure. To provide a central control of budgetary plans and to bring about co-operation and co-ordination there is often created an Advisory Committee composed of the heads of the principal departments and presided over by the President. This Committee must approve all estimates before they become effective. The responsibility for the preparation of the departmental estimates is placed upon the heads of the departments. In some companies after the budget is approved by the Advisory Committee it is submitted to the Board of Directors for consideration and approval.

The duties of the President, the Advisory Committee, the Staff Assistant to the President, and the Departmental Heads with reference to the budgetary program may be summarized as follows:

a) The President.

The President of the company has direct control over all matters pertaining to the budgetary program. All officers to whom authority is delegated by him are acting as his agents and are responsible to him for the proper performance of their duties. In all cases of disagreement between departments with reference to the co-ordination of estimates, the decision of the President is final.

b) The Advisory Committee.

Under the authority and direction of the President, the Advisory Committee considers all departmental estimates and makes such changes and revisions as it thinks desirable. No estimate is effective until it has received the approval of the Advisory Committee. In the consideration of the departmental estimates the Advisory Committee may call on departmental heads to explain the reasons for any variations in their estimates from the performance of past periods.

The committee receives through the Assistant to the President monthly reports showing comparisons of the performance of the past month with the estimated performance. On the basis of these reports it may make revisions in the budgets for the remainder of the period if it deems such revisions necessary.

c) The Staff Assistant to the President.

Under the authority and direction of the President, the Staff Assistant to the President has general control and supervision over the preparation and execution of the budgetary program. His general duties may be classified under the following headings: (1) To receive from the departmental heads the monthly estimates discussed above; (2) to transmit these estimates to the Advisory Committee with such recommendations as he may think necessary; (3) to receive from the Advisory Committee the estimates as approved and to transmit these to the departmental heads; (4) to receive monthly reports prepared by the operating departments or the General Auditor's Department showing the departmental performance for the month; (5) to transmit monthly reports to the Advisory Committee showing a comparison between the actual performance and the estimated performance for the month for each department and to make such recommendations as he may deem necessary; (6) to transmit to departmental heads any revisions in the original estimates which have been made by the Advisory Committee; (7) to recommend to the President, and the Advisory Committee, such changes in the budgetary procedure as he may deem desirable.

He has the implied authority to do all things which are necessary to the proper performance of these duties.

d) The Departmental Heads.

These executive heads of the various departments are responsible for the preparation of the estimates of their departments. Any recommendations which any departmental executive desires to make with reference to changes in budgetary procedure must be transmitted

in writing to the Assistant to the President. He will refer these recommendations to the Advisory Committee.

As previously explained, after the budgetary program is formulated it is necessary to have periodic reports showing the performance of each department that a comparison may be made between the estimated and the actual performance. It is necessary, therefore, that two things be done: (*a*) reports desired be determined, (*b*) responsibility fixed for the preparation of these reports.

After the departmental estimates have been approved, it is necessary for each department to formulate plans to carry out its estimate. The method by which this is done will vary with the different departments. For instance, the sales department may find it necessary to set up quotas for the different sales units and for salesmen at each unit in order to secure the amount of sales called for by its estimate. The production department will find it necessary to set up balance of stores records that the inventory schedules called for by the production budget may be maintained, and to operate a planning department that its schedule of finished goods may be enforced. Other departments will find it necessary to use similar means to carry out their budgetary program.

See also p. 337. Measuring Aids, Quotas and Budgetary Control.
p. 520. Budgeting for Cash Receipts and Disbursements.

D. STANDARDIZATION

[The student will do well to read this selection with the issue, "Should a business have a division or department of Standards and Records?" before his mind. If so, should it be responsible for "measuring and communicating aids"?]

I[1]

The forward march of civilization has only been rendered possible by the adoption of standards. Standards passed on from father to son and from generation to generation represent the ratchets on the wheels of progress, and have enabled each forward step painfully and slowly made, to be maintained. Without the privilege of drawing on the accumulated experience of the race as represented by its standards, each individual would be compelled to start in right at the beginning and progress would have been impossible.

[1] Adapted by permission from G. C. Harrison, *Cost Accounting to Aid Production*, pp. 33–34, 39–40. (The Engineering Magazine Company, 1921.)

Whereas the savage had very few and simple standards, as civilization developed standards increased in tremendous degree both as regards number and complexity, and in modern life the standards covering the multitudinous activities of human kind are of incalculable number.

Until recent years the standards followed by the various trades were largely rule-of-thumb or traditional knowledge, and as Mr. Taylor stated in the *Principles of Scientific Management*, "instead of having only one way which is generally accepted as a standard, there are in daily use, say, fifty or a hundred different ways of doing each element of the work."

In the management end of industry we also find a variety of standards or ideals, many of which are wholly false or only partly true. In some concerns the main standard appears to be a large tonnage, and where this idea is most rampant, time and time again it will be found that at the close of the month light but highly profitable work will be relentlessly sidetracked, no matter how urgently required by the customer, in order to manufacture some relatively unprofitable but heavy material for which there is no immediate demand but which will enable the month's tonnage production to appear in a favorable light to the directors. We are all familiar with the wild scramble in many shipping rooms at the close of the month to get out goods in order to swell the month's shipments.

The fundamental idea underlying scientific management is the substitution of definite, scientifically determined standards for all these nebulous ideals, and clearly defined methods of reaching these standards for haphazard and rule-of-thumb methods. This obviously applies to all phases of scientific management such as time and motion study, standard practice instructions and planning and dispatching methods.

Standards and records are as inseparable ideas as latitude and longitude, debit and credit, east and west. Standards without records are as ineffective as firing at a target would be if the marksman had no means of determining whether he was making hits or not, and, *vice-versa*, records without standards would be equivalent to carefully recording the result of every shot but giving the marksman no definite target at which to aim. With standards and no records we are in the position of a traveler with a time table and no watch, while conversely with records without standards we are in the position he would be with a watch but no time table.

A very common illustration of standards without records is presented by the concerns who issue many rules and instructions but provide no systematic method of ascertaining whether such instructions are followed, with the inevitable result that they are "more honor'd in the breach than the observance," and in the innumerable systems which are operated in a way far different from that originally intended.

A further illustration of the use of records without standards is that of the man who keeps the most minutely detailed account of his personal expenditures, but has no budget to work to, with the result that having no definite scheme of saving, his accounts do not materially aid him in this connection, but merely provide him with the sad history of where his money went.

Numerous illustrations of standards combined with records present themselves, among which may be mentioned: taximeters which show the actual amount earned figured at a standard rate for a certain distance; the time book on which a red line is ruled at the opening hour, all persons signing above the red line being on time and all after late; or the recording time clock which shows in printed red ink figures all cases of tardy arrivals, or variations from standard. The budget systems of finance when properly carried out are perfect examples of the effectiveness of combining standards and records, the standards being the appropriations made for the various purposes and the records showing the extent to which the actual payments made conform to these standards.

II[1]

The *Century Dictionary* defines a "standard" as "that which is set up as a unit of reference; a form, type, example, instance or combination of conditions accepted as correct and perfect and hence as a basis of comparison; a criterion established by custom, public opinion or general consent; a model."

The above definition, almost but not quite, gives the significance of the word "standard" as it is used in connection with scientific management. If we change it to read: "*That which is set up as a form, type, example, or combination of conditions accepted as correct; a criterion, established as a result of scientific investigation,*" we should have a better definition of the term in the limited sense in which it is

[1] Adapted by permission from H. K. Hathaway, "Standards," *Bulletin of the Taylor Society*, V (1920), 12–13.

used in this paper. Inasmuch as it is the destiny of mankind to constantly advance and improve I would add, parenthetically, "*for the time being*," or "*representing the present stage in the development of the art.*"

We may classify the standards of scientific management under the following headings: Equipment: including machines, tools or implements, facilities for handling, transporting or storing materials; materials; methods; accomplishment; product.

Standards of accomplishment are dependent upon standards of equipment, materials, methods and product.

III[1]

To operate an office efficiently, it is necessary to make critical analysis of results and purposes, to maintain a certain standard of production or know why it does not exist, and to promote plans working for efficiency.

Several years ago The Curtis Publishing Company began work of this nature. It was soon apparent that it could be most efficiently handled by staff specialists. A group known as the Standardization Division was formed. These people spend their time exclusively in the analysis of work, planning of new methods, determination of standards, working out and promoting of prize offers, establishment of schedules, and in other similar activities. The specialists work in all departments, both office and factory. In this way we have one department working together for the good of the Company as a whole, working with the knowledge of what changes will mean in other departments, and working for general efficiency, rather than a number of departments working separately and often blindly in so far as interdepartmental relationship is concerned for the improvement of method and quality, or for their own individual curtailment of expense.

This method may lead you to suppose that our Standardization Division has direct authority over our management. This is untrue. The division has no authority whatever. They are given free foot for unlimited investigation, our cost records are open to them, our company problems are theirs—they have the right of appeal. It is the job of the standardization force to "sell" their plans to the management by demonstrating the practicality and economy of them.

[1] Adapted by permission from W. D. Fuller, "Application of Scientific Principles to Office Management," *Bulletin of the Taylor Society*, IV (1919), 8–9.

In this way, the activities of our managers are in no way hampered, their authority is in no way curtailed, while at the same time the standardization force is kept keyed up to a high standard of endeavor. This method is not the quickest in its action. Evolution never works as rapidly as revolution, but its results are lasting. Many things can be accomplished in this pleasant way without recourse to the doubtful expedient of revolutionary change. Our plan has been in effect eight years. The results which have been obtained, the better work which is being done, and the savings which have been made, have won the hearty accord of even those executives who were formerly unsympathetic with the plan.

See also p. 555. Standardization in Manufacturing.
p. 333. Measuring Aids May Result in Expense Standards.
p. 520. Financial Standards.

E. ECONOMIC SELECTION[1]

Economic selection is choice based solely on long-run least cost. A wooden sidewalk may cost less to build than one of concrete, and yet not cost less in the long run, for the wooden sidewalk will require repairing and rebuilding much oftener than the concrete. To ascertain which sidewalk will cost the less "in the long run" is to solve a problem in economic selection. So, to determine which promises to be more economical, to build the railroad around or over the hill at a low first cost and with a high-annual operating cost, is a problem in economic selection.

The frequency of the occurrence of the problem of economic selection may be illustrated by an example taken from transportation service. Let us say that transportation service is required between two towns. Among the structures which can be made to perform this service we have the trail, highway, canal, railroad, etc. At this point is met the problem of making the economic selection from the foregoing possible structures. Let us assume that the railroad is determined to be the most economical structure for the stated service. The next step is to choose the most economical route for the railroad between the two towns. Assume the choice made and

[1] Adapted by permission from J. C. L. Fish, *Engineering Economics*, pp. 1–3. (McGraw-Hill Book Company, 1915.)

the center line of the railroad staked out. After the railroad is located there arise the problems of selecting the most economical structures for its major parts. For example, the service to be performed by one part of the railroad is to support the track as it passes over a valley and stream therein. Shall this part of the railroad be a trestle or a bridge? Let us suppose that a bridge is ascertained to be the more economical. Next it is necessary to consider the bridge by itself. It may be built of wood, of stone or concrete, or of steel, or of a combination of any two or more of these; and it may be of any one of several types. Suppose that on making economic comparison, a steel span with concrete abutments is chosen. Next the attention is directed to the various parts of the bridge, each in turn, and economic selection is made for each part. So the work of making economic selection goes on, even to choosing the footing course of the abutment and the paint which shall be used to cover the steel span. Let us imagine, now, that all parts of the railroad have been selected and designed in detail. After this comes the construction. There are different methods of constructing each component structure. For example, the earthwork can be executed with plows and scrapers drawn by horses, or with steam shovels and cars, or otherwise. For each part of the earthwork one of the possible methods must be selected. Finally, the railroad must be operated, and economic selection must be made from the different feasible ways of conducting the operation as a whole, and from the various ways of conducting each component operation.

In the foregoing illustration of the frequency of the occurrence of the problem of economic selection we have omitted to mention the fact that before any structure can be properly selected from a number of feasible structures the major parts and characteristics of each must be selected tentatively and in a general way for the purpose of estimating cost. The omission of descriptions of advance tentative selections does not, however, in any way impair the illustration.

Wherever it is possible to devise two or more differing structures capable of performing a stated service, or to make two or more designs for a selected structure, or to devise two or more ways of constructing a designed structure, or to devise two or more ways of operating a completed structure to perform the stated service, the problem of economic selection arises. This is true in the case of small as in the case of large structures.

It would appear that the principles of economic selection are an important part of the knowledge which is indispensable to owners or their executives and to all others who hold responsible positions in connection with the choice, design, construction, or operation of structures.

See also p. 93. How to Strike a Balance in Location Factors.

F. THE RANGE OF TIME AND MOTION STUDY[1]

In its original conception the Taylor system of scientific management seems to have been literally a system of shop management concerned primarily with the problem of efficient manufacture or productive efficiency in the shop. The problem was to secure the most effective character and use of machinery, tools, and materials, the most effective material and organic arrangements in the shop, and the full co-operative activity of the workers.

As time passed, however, the character, scope, and significance of scientific management seem to have steadily enlarged in the minds of Mr. Taylor, his immediate followers, and his imitators, so that when the term "scientific management" was definitely adopted by adherents of Mr. Taylor as descriptive of his system, the intent, apparently, was to emphasize claims for it much broader and more fundamental than those originally made—claims which seem to warrant the following summarization:

1. Efficiency, not only in the mechanical aspects and as it depends on organic arrangements and human effort in the shop, but with respect to the functions of a going industrial establishment, is governed by fundamental natural laws, not made by man and unalterable by man. And not only this, but the direct relation between productive effort and human welfare, as well as the distribution of the products of industry, is likewise governed by such natural and unalterable laws, i.e., the specific character and amount of work which any laborer can and ought to do, and the proportions of the product which ought to go to management and men and to each individual workman are thus governed.

2. Scientific management has discovered the *means* by which the facts underlying these natural laws, which govern production in the

[1] Adapted from R. F. Hoxie, "Scientific Management and Labor Welfare," *Journal of Political Economy*, XXIV (1916), 833–43.

larger sense—productive welfare and distribution—can be determined and established as objective, matter-of-fact data, quite apart and divorced from human judgment, opinion, or will; i.e., the means by which all productive arrangements and processes, and all the relations between managers or employers and workmen, can be reduced to an exact scientific basis of objective fact and law—a means, in other words, in the application of which human will, judgment, and cunning cannot enter so as to affect the result, and which, therefore, will necessarily reveal the truth in regard to the most efficient arrangement and method, the kind and amount of work which any man can and ought to do, and the share of the product which every factor and every individual ought justly to receive. This means is time and motion study.

"Scientific management," declared Mr. Taylor, "attempts to substitute in the relations between employers and workers the government of fact and law for the rule of force and opinion. It substitutes exact knowledge for guesswork and seeks to establish a code of natural law equally binding upon employers and workmen." In time and motion study it has discovered and developed an "accurate scientific method by which the great mass of laws governing the easiest and most productive movements of men are investigated. These laws constitute a great code which, for the first time in industry, completely controls the acts of the management as well as those of the workmen."

But, apparently, according to Mr. Taylor, time and motion study not only *makes possible* the ruling out of force and opinion from industrial affairs, a relatively just distribution of the product, and the protection of the worker's welfare at all points, but, coupled with the fundamental natural laws which govern all industrial affairs and relations, it *actualizes* this possibility.

It *makes possible* the assignment of each worker to the task for which he is best fitted, and the safeguarding of him against over-fatigue and over-exhaustion; and because of this same harmony of interests it turns the possibility into reality. It not only makes possible the removal of the higgling for advantage and the rough and arbitrary discipline of foremen and employers, but it actually eliminates these things.

"Scientific management," declared Mr. Taylor, "democratizes industry. It gives a voice to both parties, and substitutes the joint obedience of employers and workers to fact and law for obedience to personal authority." "No such democracy has ever existed in

industry before. Every protest of every workman must be handled by those on the management side, and the right or wrong of the complaint must be settled, not by the opinion of the management or the workman, but by the great code of laws which has been developed, and which must satisfy both sides." It gives "to the worker in the end equal voice with the employer. Both can refer only to the arbitrament of science and fact."

There can be little doubt, then, that Mr. Taylor looked upon scientific management as truly scientific in the sense that its productive and distributive policies and methods are based upon unalterable laws of nature and upon facts discoverable, but unalterable, by the management or workmen concerned. In this his followers appear to have been well in accord with him. Moreover, it is evident that time and motion study is the principal means upon which they rely for the discovery of this scientific foundation of scientific management. *Time and motion study, therefore, must be regarded as the chief cornerstone of scientific management, its main distinguishing feature, and the point of departure for any understanding and judgment of its claims, especially with reference to its scientific character and labor welfare.*

In its narrower conception, and as understood by labor, generally, time and motion study is looked upon simply and solely as an instrument for task-setting and efficiency-rating, used thus, in the main, to determine how much can be done by a workman engaged in a given operation, within a given time, and, therefore, to set the maximum task accomplishable by him and the group of laborers to which he belongs. Labor thus pictures a cowering workman over whom stands a labor driver. In one hand he holds a split-second watch. In the other he has a sheet of paper on which are set down the elementary motions of which the job is made up, with spaces opposite each in which may be recorded the time taken by the workman to make each motion. The watch is started. The workman jumps to his task. The time taken for each motion involved in the doing of the job is recorded. The operation is then repeated enough times to satisfy the observer that he has discovered the shortest time required by the worker to make each motion. These shortest times are then summed up as the necessary time, and this, with some allowance for human necessities, breakdowns, and delays, is set as the task time.

This, I say, is labor's habitual conception of time and motion study. It is supposed to be employed only or mainly for the purpose of task-setting, and it is assumed to be used to set the minimum time

or the maximum task to which the laborers can be forced. This view of time and motion study, however, accords ill with the later and enlarged conception held, apparently, by Mr. Taylor and by many, if not all, of the present members of the scientific-management group. Judged by this standard, it is erroneous in two very essential respects.

In the first place, time and motion study, according to this later conception, when used for task-setting purposes, is not designed to discover and set the minimum time or the maximum task, but the scientific time or task, i.e., the reasonable or just task, considering the technical conditions, the character and training of the workmen, the element of fatigue, etc.

In the second place, time and motion study, in its larger conception, is not merely or perhaps mainly a method used for task-setting and efficiency-rating. On the contrary, in the light of the recent claims based upon its use, made by Mr. Taylor, and of the problems to the solution of which it is apparently being applied by progressive scientific managers, *time and motion must be conceived as little less than a universal method of attempted accurate industrial analysis*, usable with or without the stop-watch to discover at almost every step of the productive and distributive process, not only the most effective material, organic, and human arrangements, adaptations, and combinations, but the reasonable demands which can be made upon the intelligence and energy of the management as well as the men, and the just apportionment of the product to all the factors and individuals concerned.

According to statements made by scientific managers, this process of analysis, or time and motion study, in the larger sense, should where possible begin with the determination of a site for manufacture. The really scientific manager, starting out *de novo*, will consider all available sites with reference to the time and motion expenditure, determined by actual experiment, necessary in securing an adequate supply of proper materials, in the going to and from the shop of the numbers of the different classes of workmen needed or likely to be needed, in the shipment and marketing of the product, etc. Having in mind the character of the productive process, and the most efficient productive arrangements possible, he will then, with regard to the greatest possible saving of waste time and motion, work out with the utmost care and with reference to future expansion the plans for the construction of his plant. This will involve a most careful study of all the general

internal arrangements and processes, the most efficient methods of planning the work to be done and of routing it through the shop so that there may be no delay in transmitting orders, no waste carriage of materials and partly finished products, no lost time in the assembly room waiting for delayed parts. With the same ends in view, and in the same manner, he will also determine the most effective placement of machinery, the storage of tools and materials, and the location of the various elements of the office force.

The shop constructed and the machinery installed, he will apply time and motion study in an endless series of experimental tests to determine what possible improvements can be made in machinery and its operation, and in the tools, fixtures, materials, and specific processes of work. The best feed and speed for each machine, with reference to the different grades of materials, will then be established. The different jobs or processes will be analyzed and re-analyzed, and their elements experimentally combined and recombined, the tools and fixtures changed and rearranged, and all these variations timed and retimed in an effort to discover the most efficient productive combinations and methods.

This time and motion study analysis will extend, it is thus claimed, to every feature and all organic relationships of the mechanical process of production. But it will not stop there. It will be extended to cover the managerial functions and the office work. The duties of the managers, superintendents, and especially of the shop foremen will be analytically studied and reorganized. As a result, the work of the old managerial functionaries will be split up and new departments with new department heads established. In place of the single old-line foreman, for example, charged with hiring, discipline, discharge, apportionment of work, the setting up of jobs, the determination of speed and feed of machinery, repair of machinery and belting, inspection of the product, etc., there will be a separate head charged with the selection, hiring, adaptation, and discharge of workmen, and a series of functional foremen, each responsible for a particular duty, e.g., a gang boss, a speed boss, a repair boss, an inspector of work, an instructor, a route clerk, a time and cost clerk, a disciplinarian. The methods of storage and delivery of tools and materials, the dispatching of orders from the office to the shop, the purchasing of materials, the marketing of products, and all the methods of accounting will likewise be subjected to time and motion study, in this larger sense, with a view to discovering the most efficient means and methods.

All this and much more is time and motion study in the larger conception of the term, which seems to be sanctioned by progressive scientific managers. And not until, through this broader time and motion study, a larger degree of improvement and standardization of the general productive process has been well advanced, should the scientific manager, according to these experts, enter upon time and motion study in the narrower sense, i.e., putting the time-study men, with stop-watches, over the workmen engaged in a particular job for the express purpose of setting tasks and rates of wage payment.

Nor, under the direction of this really scientific manager, we are told, will this part of the time and motion study correspond to the conception of it held by labor. On the contrary, it will be done in the same spirit and with the same care that we have noted above. It will endeavor to discover by repeated analysis and experimental timing the best character, combination, and arrangement of tools, materials, machinery, and workmen, the most efficient and convenient lighting, heating, and seating arrangements for the workmen, the proper period for continuous operation by them, considering the element of fatigue, the rest periods needed, their most efficient character, combination, and sequence of motions, etc. Moreover, these particular job experiments will not be confined to one man, or to a few of those who are to accomplish the task. Many men will be timed with the idea of discovering, not the fastest speed of the fastest man, but the normal speed which the group can *continuously* maintain. If necessary, hundreds and perhaps thousands of time and motion studies will be made to determine this, before the task is set and the rate established. And whenever a new or better method or combination has been discovered by the time and motion analysis, which is supposed to continue even after the task is set, the whole process of careful and extended timing for task-setting will be repeated, and new tasks and rates established reasonably conformable to the new conditions.

Finally, as an integral part of this broader time and motion study, all the results secured by it will be continuously and systematically filed as a permanent asset and guide to future action. Thus conceived, time and motion study appears to be considered a method of analysis applicable to practically every feature of the productive and distributive process, considered apart from its purely financial aspects, a process of analysis applied continuously throughout the life of the establishment. And the scientific management based upon it is

conceived to be a perpetual attempt to discover and put into operation the new and continuously developing technical, organic, and human arrangements, methods, and relationships constantly revealed by it to be more efficient and more equitable. That this broader conception of time and motion study as the essential basis of scientific managements exists, not as a mere dream, but as a practical ideal striven for with the confident hope of realization, the writer can attest from his experiences in the best class of scientific-management shops.

For other selections bearing upon Measuring and Communicating Aids of Administration, *see*

pp. 192–226. Measuring Aids of Personnel Administration.
pp. 325–40. Measuring Aids in Sales Administration.
pp. 370–74. Measuring Aids in Purchase Administration.
pp. 581–602. Measuring and Communicating Aids in Production.
p. 149. Education and Training.

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7. THE NEW INDUSTRIAL LEADERSHIP[1]

If we consider the industrial history of the United States for the long span dating backward from this year of grace to about 1840, we can distinguish at least three great movements which have occupied the minds of men in industry.

The first period was still engaged in the process of settling the country, as previous decades had been. In section after section of the newly opened West there was required that basic equipment which is the foundation of modern civilized life. Our nation's first industrial task was the stupendous one of clearing the farms, and of building the common roads, and of establishing villages and cities, and of opening outlets for the marketing of surplus products. The victory was not to mere parsimony and patience, and the weaker economic virtues, but to industry animated with boldness, planning touched with imagination, and sacrifice sustained by a vision of a new state and a fairer civilization.

[1] Adapted by permission from E. D. Jones, *The Business Administrator*, pp. 1–21. ((The Engineering Magazine Company, 1914.)

The second industrial movement of the period we are considering centered upon the task of providing an adequate mechanical equipment. Its characteristic achievement was to develop inanimate sources of power, and apply them in a thousand new ways to lift the burden of physical toil from human shoulders. Accordingly, the second act transfers the scene of chief significance from the field to the factory. The first billet of Bessemer steel was produced in America in a little furnace at Wyandotte, near Detroit, in 1864. The first band-saw was brought from Paris to New York in 1869. The first middlings purifier essential to the modern milling process was built in Minneapolis in 1870. The twine-binder was invented in 1874. In the wonderful centennial year of 1876, there was given to the country the telephone, the incandescent light, the typewriter, and the first steel-frame building. In the middle years of the seventies the hermetical sealing and the refrigeration of fruits and meats was achieved, so that a great additional range was possible for the dietary of the nation.

And now that these achievements are no longer in their origins, and that the issues called up by them are recognized as virtually settled, and as there is no longer any threatening opposition to try men's souls in the process of establishing and defending them, a third industrial problem can be seen to emerge and become the center of interest. This is the question of business administration.

This administrative phase of our industrial evolution has, of course, already a history of value; and this history is concerned with the doings of a very interesting generation of men. For years the United States, with its enormous domestic market, its ample capital, its freedom from tradition, and its colossal daring, has been perhaps the most favorable spot in the world for trying out new ideas of organization and management. The executives who first took advantage of these conditions were, for the most part, self-made men. We often refer to the more noted of them as captains of industry. The majority were individuals of pronounced motor temperament and endowed with exceptional talents: men capable of fighting their way upward and of gaining the advantage in a rough-and-ready struggle for the survival of the fittest.

These men seized leadership by right of ability, but, technically speaking, they secured it as the perquisite or privilege arising from the ownership of great fortunes. They lived in a day when men generally managed their own capital. In many cases they were the

first to build up institutions of great size in the lines of industry with which they were connected. Their policies were like those of most conquerors—direct, simple, and intensely personal. Living in a highly individualistic and self-confident society, they worked out rules of action, each man for himself. As the attention of a new community naturally centers strongly upon the process of growth, many of them were builders rather than administrators; more comfortable with tests of excellence which were physical rather than intellectual, private rather than social. As their communities had broken sharply with European traditions, and had as yet little applicable history of their own, they entertained a poor opinion of lessons drawn from the past. As they were devoted to little else than industry, they saw few analogies between the administration of business affairs and the administration of other forms of social action.

Being so much in a world of their own creation, they looked upon the administration of industrial enterprises purely as a process of each man minding his own business. Their organizations were, therefore, mere extensions of themselves, usually bearing their names and ruled as their households might be. Enterprises so conceived were incapable of serving as a rallying-point for the loyalty of the various classes of persons who might become connected with them. The owner alone was fully energized. He carried staggering loads of responsibility, driving affairs forward by individual energy rather than by the true administrative process of evoking and guiding the energies of others.

Whatever reservations have to be made in praise, the courage and independence of these men must be recognized as splendid. They possessed a thorough mastery of details, as a result of the small beginnings from which they started. They had the ease and speed of decision due to technical mastery and early imposed responsibility. They were preserved from errors of theory by a wholesome and intimate sense of reality. The names of the leaders of this generation of giants will long remain household words in America.

Since the ranks of the first generation of administrators have begun to be seriously thinned by death, a notable change has been taking place in the character of our industrial leadership, and in the conditions under which it is exercised. The growth of business into units embracing, under a single administration, hundreds and even thousands of stockholders and employees and uniting many minds in operations which require long periods of time for their com-

pletion, call for searching tests of performance, and exact and just methods of apportioning rewards, so that the wills of many persons can be brought into energetic concurrence. These changes are transforming the business administrator from a mere owner of private property into a responsible agent, exercising delegated authority. They increase the element of trust or responsibility or service, for the measurement and valuation of which a new outfit of standards is urgently needed.

The occupant of this position will be the central pivot upon which a vast number of human relationships will turn. Upon these men will rest a sort of trusteeship to preserve the property intrusted to them, and a demand of leadership to guide and guard their employees. Upon them will also rest a general responsibility to the public to help this day to live its life, and this generation to make its contribution to progress. The whole situation conspires to create an opportunity for a new race of executives, which shall justly appreciate the various classes of responsibility resting upon it.

The old ambition to build up big business units, and to accumulate great fortunes, is now no longer so fresh and full of zest as it once was. It does not get the response, and call out the best men, as in the old dramatic, careless, buccaneering days. To simply repeat what the last generation did in the way of piling up fortunes, and to do it on the same intellectual and aesthetic and ethical plane, but without the novelty of being the first to do it, nor the excuse that first comes bread and then the higher things of life, and without even the freedom of action and the general applause of the days of laissez faire, is not to set forth a very moving aim. The hungry intelligence of industry is asking for great new objectives worthy of great efforts. It asks for tasks as noble for us now as the opening of the continent or the building of the railroads was for a past generation. A new and larger conception of the function of industrial leadership is called for.

See also p. 764. The Mental Aspects of Administration.

REFERENCES FOR FURTHER STUDY

Church, *The Science and Practice of Management.*
Scott, *Influencing Men in Business.*
Taylor, *Scientific Management.*

CHAPTER X

ANALYSIS OF A BUSINESS CASE

Purposes of this chapter:

1. **To get a clearer view of what may be involved in expanding a business.**
2. **To test our ability to form certain kinds of business judgments on the basis of some typical business data.**

Throughout this volume there has been frequent use of "case material" of the sort that sets forth a series of actual occurrences in some field of business activity. These cases have, however, usually been narrow in their scope. It is now expedient for us to take some "business case" of fairly wide reach and see if we have developed any ability to form tentative business judgments.

The case chosen for this purpose is that of the Noel Slate and Manufacturing Company. Noel, a successful salesman in the slate business, developed a small-scale manufacturing and selling business in this field. A bit later he thought that he saw an "opportunity" in the slate business and he decided to reorganize his company so as to take advantage of this opportunity. He needed capital. His way of securing it was to circulate among his friends and business acquaintances the following material. You will find it interesting not only as an illustration of how such things are sometimes done but also as an opportunity to "test your teeth" on an actual problem.

The material is presented under four heads:

A. The Engineer's Report
B. The Accountant's Report
C. The Prospectus
D. The Stock Subscription Form

PROBLEMS

1. What seems to you the "big idea" which Noel conceived?
2. Review the selection on "Promotion and the Promoter" (pp. 390–91). Indicate the various stages of promotion of the Noel Slate and Manufacturing Company.

3. What is Noel putting into this proposition? What does he hope to get out of it?
4. At what points, if any, do you criticize the engineer's report?
5. At what points, if any, do you criticize the accountant's report?
6. What criticisms, if any, do you make of the prospectus? Write a better one.
7. Noel obviously wishes to have control of the new corporation. Has he control? If so, is his control secure? If not, suggest appropriate ways of getting secure control.
8. What do you think of the way Noel went about securing funds? Would he have done better if he had gone to some investment credit institution?
9. Could this project have been handled better in the form of an individual firm or a partnership?
10. Assume that you are considering whether you should invest in the stock of this new concern. Tabulate the strong and weak points of the proposition. What conclusion do you reach?
11. Add five problems to this list.

A. The Engineer's Report

Part I

In making this report, our engineer spent a week in the Western Vermont Slate Field, and visited all of the mills, quarries, and prospects mentioned. While the detail lists of equipment were taken from the report submitted by your resident engineer, all data and statements made in that report were carefully corroborated in detail by our engineer. We can, therefore, subscribe to, and indorse that report in every particular.

The credit reports of a prominent mercantile agency are included in this report to give evidence of the soundness of the industry even conducted in the primitive way it is today.

Careful reference should be made by interested parties to Bulletin No. 586 of the United States Geological Survey, entitled, "Slate in the United States," which should really be considered a part of this report.

All letters quoted in this report are now on file in your office.

INTRODUCTION

Object.—The object of this report is to determine: First, the advisability of entering into the milled slate industry in this field on a large scale. Second, the most advisable procedure in the event of entering into this industry.

Description of the industry.—The quotations in this report are from Bulletin No. 586 of the United States Geological Survey, entitled "Slate in the United States," by T. Nelson Dale and others, to which reference should be made for a technical discussion of the composition and formation of slate.

"The term *slate*, in ordinary usage, denotes a rock which has more or less perfect cleavage, being thus adapted to various commerical uses."

Quarrying.—While in most cases the slate outcrops on the surface, considerable stripping, or removal of upper soil and rock, must be done before slate of any commercial value is reached. The slate in the western Vermont field has a dip of from 15 to 50 degrees depending upon the locality. In opening a quarry a large hole is dug in front of the face of the slate vein to allow easy working of the vein. The top of the vein is then stripped down to slate of commercial value.

The present practice in removing the slate is to drill through the exposed face of the vein, at right angles to the cleavage, at intervals of approximately 12 to 18 inches, to a depth of about 8 inches. Steel wedges are then inserted into these holes and pounded with hammers until a slab splits away from the vein. This slab is then hoisted and carried to stock by means of an overhead cableway. Until quite recent years the drilling was done by hand and the hoisting of the rock, and pumping of water from the pit, was done by horse-power. At the present time electric power is available and the drilling is done by compressed air and the hoisting and pumping by means of electric motors. In some veins it is also possible to cut out the slabs by means of channeling machines, as in the marble quarries. These machines, by means of compressed air drills mounted upon them, cut the exposed face of slate into rectangles of the desired size in much the same way that ice is cut on an ice pond. After these cuts have been made to the desired depth, the slabs are wedged away from the main body of the rock. This method is much faster and more economical than the old hand method of quarrying.

After the first hole is sunk additional stripping is done by blasting, the overburden being blown over into the hole from which the slate has already been removed. Practically no powder is used in the slate itself on account of breakage.

The maximum size of slabs removed from the quarry is generally governed by the natural joints in the vein. The usual thickness of slabs at the present time is approximately six inches, but with the

introduction of modern machinery in the mill, it will probably be more economical to use slabs up to 18 inches in thickness.

Roofing-slate is sawed, planed, split, and trimmed at the quarry. The mills for finishing mill stock are generally located at a considerable distance from the quarry on account of labor supply, facilities for shipping, etc. The mill stock is hauled from the quarry to the mill by automobile truck, teams, electric or steam railroad, or in one case by boats.

Milling.—"On account of their peculiar properties slates are adapted to a great variety of uses—roofing, flooring, electric switch-boards, blackboards, hand slates, billiard and laboratory table tops, vats, tubs, mantels, grave linings, wainscoting, hearths, chimney and well caps, memorial tablets, bread boards, refrigerator shelves, etc."

Slate at the quarry is divided into two classes: roofing-slate and mill stock. Mill stock would include all of the slate used for the purposes mentioned above except roofing.

The large slabs when received at the mill are laid out by the foreman for cutting into standard sizes, or sizes determined by the orders on hand, with the least possible waste. They are then placed on the bed of a table saw similar to a cross-cut saw in a wood-working plant. The saw itself is a circular steel saw, about 48 inches in diameter, with coarse teeth.

After sawing to the required rough size, the slate is split so as to finish to the required thickness, and the flat surfaces parallel to the cleavage are smoothed down by means of a planer. This planer is almost identical with planers used in machine shops for finishing iron and steel. The tool covers 8 to 12 inches in width.

After planing, the slate is removed to a finishing machine called a rubbing bed. This machine consists primarily of a disc, or table, of cast iron, usually 12 feet in diameter, mounted at a convenient height above the floor on a vertical shaft driven by a mortise gear. This table revolves at a speed of 70 R.P.M., and sand and water are fed onto it at the center. At the present time all sides and edges of slabs are finished by holding the slab stationary while the plate with its sand and water revolves under it. By the proper distribution of weights on the slab, a uniform rate of cutting is secured.

Beveling of the finished slab is now done roughly with an air chisel and finished with a rasp and hand hone. A bevel of $\frac{5}{8}$ inch requires from three to five cuts with the chisel besides the time and labor required to finish with rasp and hone.

If a finer finish than the rubbed finish is desired it is obtained by means of a hand hone, or by a polishing head upon which a hone is mounted.

At present only two of the mills in this field are equipped to drill holes in switchboard slabs.

After the slabs are completed various finishes are applied. They are enameled black and baked, oiled, or marbleized as desired. Enameling is usually done with an air brush, while marbleizing or graining is done by dipping the slab in a tank of water on which the color has been floated in the pattern desired.

After finishing, the slabs are crated for shipment.

Description of the field.—"The most important district, which furnishes the well-known 'green' and 'purple' slates, lies between the Taconic Range and Lake Champlain, extending from the town of Sudbury, in Rutland County, southward to Rupert, in Bennington County, a distance of 26 miles. This belt also passes south-southwest into Washington County, N.Y., where, however, it has thus far proved of less economic importance."

This district is shown in detail on the map accompanying this report. The locations of quarries and prospects are only approximate, except the Cedar Point Quarry and the Lake Shore Slate Co. prospect, which are accurately located.

Practically all of the mills are located in Fair Haven and Hydeville.

Transportation in the field is furnished by the following: Rutland Railway, Light and Power Co.—an electric line running from Poultney through Fair Haven to Rutland. Rutland is 16 miles east of Fair Haven. Delaware and Hudson Railroad—two branches. Rutland Railroad from Rutland North and South.

The center of the labor supply for this industry, both in the quarry and the mill, is in Fair Haven, Vermont. While all operators state that there has been a great shortage of labor in the last two years, they agree that labor is now becoming more plentiful. The labor situation will be discussed later in this report.

Water in quantities is easily obtained in all localities.

Coal is scarce at the present time and costs $14.00 per ton. It is expected that the supply will increase and the price decrease in the near future.

Electric power is obtainable in any desired quantity at all points from the Rutland Railway Light and Power Co. at approximately $1\frac{1}{2}$ cents per kw-hr. The current is 220 volts, 3 phase, 25 cycles, but 60 cycle current can be obtained if demanded.

Cutting-sand for rubbing and polishing is readily obtained locally in large quantities.

Crating-lumber is available from local mills at an average cost of $35.00 per thousand feet, delivered.

EXISTING QUARRIES

(See map on page 860 for location)

NO. 1

Name.—W. H. Pelkey Quarry.

Location.—About 1 mile south of Fair Haven, in Vermont, on Rutland Railway Light and Power Co. electric line.

Owner.—W. H. Pelkey, Fair Haven, Vermont, owns the quarry and about 200 acres of land surrounding.

Transportation.—The output is at present handled in a mill owned by the same party, located about $\frac{1}{8}$ mile from the quarry. Good road down grade all the way past mill to Delaware & Hudson railroad station. All hauling is done at present by one team.

Product.—At present this quarry is producing nothing but green slate for structural and roofing purposes. This slate is of no value whatever for electrical purposes and is even too hard for good structural stock. The present quarry is therefore valueless for the purpose of this report. Mr. Pelkley claims to have a high-grade, clear vein on one end of his property, and is very anxious to dispose of it. This property was investigated by our engineer in company with your resident engineer, and Mr. John R. Mahar, a practical quarryman with about 40 years' experience in this field. It was decided that this purple prospect was of no commercial value whatever for the following reasons: (1) not sufficient purple slate in sight to justify working; (2) slate of good color but entirely too hard; (3) vein covered by large hill of hard rock; (4) on account of its extremely favorable location, and the scarcity of clear purple slate, this property would have been worked years ago if investigation had justified it. The property has been trenched by someone to determine the length and character of the deposit, but the results apparently did not justify working.

Equipment.—The present green slate quarry is equipped with:

One 10″×10″ belt-driven, single stage, air compressor

One 35 horse-power motor for compressor

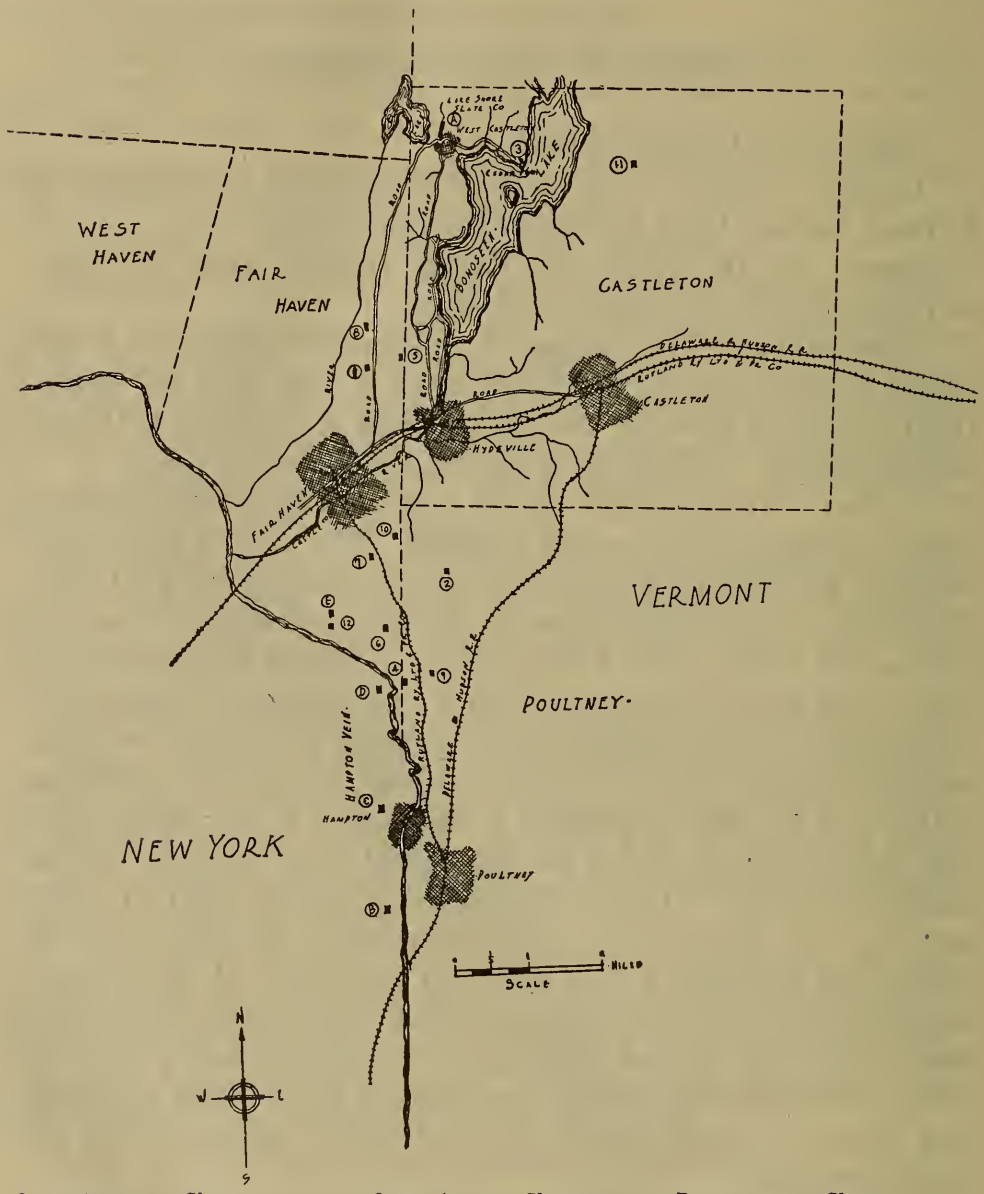
One double drum hoist

One 25 horse-power motor for hoist

Two masts and complete cableway equipments

Two shanties and trimmers for roofing-slate
One small blacksmith shop
Working force.—Seven men, driver and one team.

MAP OF THE FIELD



Quarry*	Slate	Quarry*	Slate	Prospects	Slate
1	Green and Variegated	7	Purple Variegated	A	Purple
2	Green and Variegated	8	Purple Variegated	B	Purple
3	Purple	9	Green	C	Purple
4	Variegated	10	Mottled	D	Purple
5	Variegated	11	Purple Variegated	E	Purple Variegated
6	Variegated	12	Purple Variegated		

*Locations of quarries and prospects are approximate only.

Output.—As operated at present the total output of green mill stock will probably average about 7,000 feet per month.

Sale or lease.—Mr. Pelkey will sell the entire property including land, quarry, purple prospect, and mill for $90,000.00. The mill will be discussed later in this report. The quarry property is of no value to a company contemplating the manufacture of electrical slate on a large scale.

NO. 2

[Omitted]

NO. 3

Name.—Cedar Point Quarry.

Location.—About 4 miles north of Hydeville, in Vermont, on Lake Bomoseen.

Owner.—Penryhn Slate Co., Hydeville, Vermont, own the quarry and 50 acres surrounding.

Transportation.—In summer the slate is hauled to the mill at Hydeville in barges towed by launch. In winter the hauling is done on sleds on the ice. In spring and fall, especially spring, hauling must be done over the shore road around the lake. This road is not very good and is very bad in the wet weather in spring. Haul by road is between 5 and 6 miles.

Product.—The product of this quarry is the best grade of purple slate being produced in this field. It is the only slate from this field that the General Electric Co. will purchase.

Equipment.—

Three cableways

Two double drum hoists. 34″ drum. 25 horse-power motor

One 14″×12″ Ingersoll-Rand, belt-driven, single stage air compressor

One 40 horse-power motor for compressor

Derrick for loading stock

Incline track from quarry to mill with cars and hoist

One scow 15′×30′, 40 tons capacity

One motor boat 25 feet. 12 horse-power motor

There is a rough mill located at the quarry which will be discussed later.

Working force.—Twenty-seven men.

Output.—They report average monthly output of 25,000 square feet.

Sale or lease.—This company is willing to sell this quarry together with another quarry producing roofing-slate, and both mills. The mills will be discussed later. They have been unable to get out enough stock to keep their own mill running at its capacity of 40,000 feet per month. While this quarry produces the best slate of any quarry now operating in the field, it is not considered a good purchase. Owing to physical conditions it would be very hard, and perhaps impossible to increase the output to 100,000 feet of finished slate per month. Being a very profitable enterprise the price asked would undoubtedly be very high.

NOS. 4–12

[Numbers 4–12 of the original report are omitted from this reproduction. They raise no new problems. So far as method is concerned, they differ little from the reports on Numbers 1 and 3.]

PROSPECTIVE LOCATIONS FOR NEW QUARRY

(For locations see map on page 860)

A

Name.—Lake Shore Slate Co. property.

Location.—West Castleton, Vermont. About 4 miles north of Hydeville, and about $5\frac{1}{2}$ miles from Fair Haven.

Owner.—The Lake Shore Slate Co., of Hydeville, Vermont, holds title to all real and personal property. There is no mortgage on this property. This corporation is capitalized for $80,000. The principal owner, with whom all dealings should be made, is Mr. Lester Hazard, who lives on the property, and whose father originally operated it.

Transportation.—As shown on the map, there are two roads available for hauling stock from this property. The west road, away from Lake Bomoseen, is the best road and hauling over it would not conflict with the hauling from the Cedar Point Quarry who use the lake road. It would also be very easy to carry stock from the quarry to the lake by cableway and carry down the lake either in scows or on the ice.

Product.—This property was opened up on one end of the vein years ago and operated profitably. It has not been operated however since the death of Mr. Hazard's father. The quarry which was opened is now filled with water to a depth of 50 or 60 feet. This could easily be pumped out in about one week. The slate exposed in this old quarry is the best clear purple slate in this field. It is

even better than that produced at Cedar Point. The vein is approximately 25 feet thick, 75 feet deep, and 1 mile long, all on this property. Approximately 10,000 feet of slate is all ready to take out of the old quarry as soon as the water is removed. The present hole extends to the bottom of the vein.

Equipment.—There is one old cableway on the property that might be used. No other equipment that could be used.

Output.—There is approximately 10,000,000 feet of good slate in sight from surface indications. This would probably be exceeded in operation. By opening the vein at several points a production of 100,000 feet per month could easily be reached.

Sale or lease.—The entire property covers 640 acres. Mr. Hazard will lease the entire slate property, including the necessary area for dumps, etc., for a flat monthly rental not dependent upon the amount of slate taken out. He made a tentative price of $400.00 per month, but this could probably be cut to $350.00 in closing. There is an old mill on the property and also a water-power wheel of 80 horse-power. If these were included in the lease the price would be $100.00 per month additional. Neither of these items should be included as the mill is of no use on account of age.

If desired will sell entire property. No price quoted.

Remarks.—This vein has a very steep dip, probably about 50 degrees. As there are few natural horizontal joints, the property was difficult to work in the old days on account of the great size of the slabs. This is not believed to be a great disadvantage with modern machinery. It would probably be possible to make use of the trenching machines used on the vertical slate in the Maine field. This is the only objection that could be found to this property locally It was pronounced by Mr. M. R. Johns as the best property in the field.

B–F

[The descriptions of these prospects are omitted. They do not differ in method from the description of prospect A.]

SLATE MILLS NOW LOCATED IN THIS FIELD

NO. 1

Name.—J. H. Prince.

Location.—One mile north of post-office in Fair Haven, Vermont.

Owner.—J. H. Prince, Fair Haven, Vermont.

Buildings.—

One building 50′×80′ frame, two-story for about half its length

Two small sheds attached

One office attached

6,500 square feet total floor space

Equipment.—

Three 10 horse-power electric motors

One rubbing-bed 12 feet in diameter

Two Ruggles saw tables, 6′0″×10′0″; 7′0″×10′0″

Two Ruggles saw tables, 4′6″×8′0″; 3′6″×6′6″

Two Ruggles planers, 3′6″×7′6″; 4′0″×9′6″

One Ruggles planer, 5′0″×10′0″

One bench saw for crating

One power operated crane for unloading

One industrial track with car from crane through mill to dump

One belted Gould duplex pump

One grindstone and carborundum wheel for sharpening saws and planer knives

One saw bench in box shop on second floor.

Toilet facilities.—Poor.

Heat.—Stoves.

Shipping facilities.—No railroad siding. Haul to railroad station about ¾ mile from mill.

Product.—Electrical slate 72 per cent; structural slate 12 per cent; billiard slate 9 per cent; grave vaults 7 per cent. Some roofing.

Output.—Claim ouput of 50,000 feet in past six months. This is probably high and 40,000 feet would be nearer the facts. The mill has a capacity of 10,000 feet per month.

Statement of billing.—

Electrical slate	25,591 ft.	$19,081.66	
Structural slate	4,185 ft.	2,615.08	
Billiard slate	3,151 ft.	1,299.35	
Grave vaults	2,354 ft.	762.00	
Totals	35,281 ft.	$23,758.09	$23,758.09
Roofing slate	608.69 sq. ft.	7,834.92	
Jan. 1, 1920, Inv. R. Slate	$2,354.00		
Oct. 1, 1920, Inv. Slate	1,500.00	854.00	
		$ 6,980.92	6,980.92
Total			$30,739.01

The foregoing billing is for period January 1 to October 1, 1920.

Working force.—Eight men.

Credit report.—The following credit report was secured.

Aged about 40, married, and has been engaged in the slate business here off and on for years, apparently maintaining a clear record and meeting with fair financial success. In the fall of 1909, he became associated with a local slate quarry, later purchasing same and has since operated in his own name. The quarry is being gradually developed.

Repeated efforts have been made to obtain a statement from him but he has never been disposed to furnish any information respecting his financial condition.

Is in good personal standing and regarded competent in this line. He is credited with the ownership of quite a fair amount of real property on which there is understood to be some mortgage encumbrance, but he is credited with having a substantial equity therein, and he is found assessed on the last Grant Tax list with various properties aggregating a total investment of $20,300. He is also credited with having some money invested in personal securities, carries a good averable balance at bank where he has been known as a borrower to a considerable extent, retiring his paper as agreed and he is looked upon here as responsible for his ordinary business requirements, but in the absence of a detailed showing of his financial condition, it is found difficult to advance a definite estimate of his net worth, though in some quarters it has been estimated at $50,000 or more. Prospects are regarded favorable.

Has the name here of taking care of his obligations in a satisfactory manner.

No fires.

Sale or lease.—Will sell complete property consisting of quarry and mill for $90,000. This price is considered excessive even if the property were desirable, which it is not. The mill has not nearly enough capacity for the purpose of this report, and is not sufficiently well built to justify expansion to the desired capacity.

Remarks.—As the slate obtained from the quarry is not of the proper quality, and the mill is not desirable, this property does not deserve any further consideration, except for the cost and selling price information contained in the foregoing description.

NOS. 2–10

[These numbers are omitted. They follow, in general plan, Number 1. The essential figures for our purposes are contained in the following summary table which covers all ten cases.]

TABULATION OF DATA REGARDING TEN SLATE MILLS NOW OPERATING IN THE WESTERN VERMONT FIELD

Number	Name	Monthly Output Feet	Floor Space Square Feet	Number of Saw Tables	Number of Rubbing Beds	Number of Planers	Number of Employees		
							Quarry	Mill	Total
1...	J. H. Prince.	6,700	6,500	4	1	3	8	8	16
2...	.....	10,000	5,200	4	1	3	9	10	19
3...	.....	25,000	13,625	9	4	9	27	24	51
4...	.....	4,000	9,180	5	2	2	4	10	14
5...	.....	5,000	4,200	4	1	4	5	10	15
6...	.....	6,000	3,800	4	1	3	15	10	25
7...	.....	8,000	4,950	3	2	3	12	20	32
8...	.....	15,000	6,425	6	3	5	6	20	26
9...	.....	15,000	8,850	11	3	8	12	20	32
10...	.....	12,000	6,125	5	2	3	5	10	15
	Totals....	106,700	68,855	55	20	43	103	142	245

PRODUCTION AND DEMAND FOR MILL-STOCK SLATE

The records of the United States Geological Survey from 1879 to date show that from 1879 to 1884 slate was produced for roofing purposes only. The table on page 867 shows the value of slate produced, for purposes other than roofing, from 1884 to date. From 1905 to date this slate is classed as "Mill Stock."

It is estimated by some of the most experienced men in the industry that the production of mill stock slate for the year 1920, in the state of Vermont, will approximate 1,200,000 feet at an estimated valuation of $780,000. This is 100 per cent increase over 1918.

At the present time it is impossible to purchase any finished slate in this field, especially electrical slate, for delivery in less than six months. All mills in the district state that they are from six to eight months behind in their orders, and they are receiving no cancellations of orders.

It will be noted from the data given for the mills in the field that in order to be assured of a steady supply of slate to meet their requirements, such firms as the Brunswick-Balke-Collender Co., Otis Elevator Co., Cutler-Hammer Manufacturing Co., etc., have been compelled either to enter the field themselves, or to contract for the entire output of a quarry and mill. Furthermore they are compelled to use inferior slate for electrical purposes. It is universally conceded that the clear purple slate is the best slate produced in this state for electrical purposes. It will be noted, however, in

the detailed report that only one mill in the district, namely the Penryhn Slate Co. is producing this clear purple slate.

It will also be noted from the detailed report of mills that none of the better class of mills desires to sell, and that prices quoted on mills and quarries are out of all reason. This condition is of course due solely to the excellent condition of the business as a whole. This in spite of the fact that there is not an efficient quarry or mill in the entire state at the present time.

Year	Value of Mill Stock		Average Price Per Square Foot
	Vermont	Entire U.S.	
1884	.....	$ 8,000	.....
1885	.....	10,000	.....
1886	.....	.....	.....
1887	.....	.....	.....
1888	.....	.....	.....
1889	$245,016	684,609	.....
1890	.....	.....	.....
1891	257,267	700,336	.....
1892	260,000	720,500	.....
1893	128,194	314,124	.....
1894	202,307	489,186	.....
1895	93,849	347,191	.....
1896	99,915	482,457	.....
1897	39,701	427,162	.....
1898	119,782	594,150	.....
1899	94,702	507,916	.....
1900	121,988	644,284	.....
1901	177,874	673,115	.....
1902	126,101	745,623	.....
1903	228,729	911,807	.....
1904	162,421	947,906	.....
1905	178,295	921,657	.....
1906	251,531	1,219,560	.....
1907	175,683	943,409	$0.157
1908	196,911	793,304	.165
1909	307,347	876,089	.171
1910	308,811	999,098	.192
1911	287,197	1,027,605	.178
1912	273,583	1,013,220	.166
1913	346,645	1,233,838	.195
1914	.....	977,930	.182
1915	.....	819,672	.179
1916	291,241	1,177,260	.200
1917	281,895	1,277,249	.230
1918	379,226	1,498,164	.310

A visit was made by our engineer to the plant of the General Electric Co. at Schenectady, New York, on Friday, November 12, 1920, to interview them regarding the demand for slate for electrical purposes.

Mr. Patterson, of the Switchboard Engineering Department, stated that slate for switchboard purposes had always been difficult to obtain, and that for the past year the conditions had been such that slate was almost impossible to get. He stated that they always preferred the black Monson slate from Maine, as this only required oiling to be ready for use. The output of this district is, however, so very limited, that the greater part of their slate must be obtained wherever possible. Mr. Patterson, not being familiar with the detail requirements of the company, introduced our engineer to Major H. M. Hobbs, of the same department, who supplied the following information:

They always try to carry sufficient slate in stock for six months' requirements, but this has been impossible for the past year. They have estimated their total requirements for the first three months of 1921 at twenty-seven car loads, of 3,000 feet each, of a total of 81,000 feet. This is for switchboard use only and does not include miscellaneous small stock used for switch bases, box linings, etc. Their popular thickness is $1\frac{1}{2}$ inches.

Mr. R. E. Carter, of this company, purchases all insulating materials. He stated that they had always had trouble getting electrical slate, and especially so in the last year. He will not buy green or variegated slate for electrical purposes except when it is absolutely impossible to get anything else. Mr. Carter has been in the Vermont field and studied it in detail. He buys a great deal of clear purple slate when it is available, and prefers that from the Cedar Point Quarry, which he states is the best slate produced in Vermont. He states that there is not only room, but an actual necessity for a well-financed, up-to-date plant in this field, producing slate of electrical quality.

Mr. Carter attributes the low production in the field to a lack of capital and initiative to put the quarries and mills on an efficient basis. He does not credit the statements of the producers that it is impossible to obtain labor. He states that on account of the extra labor and expense necessary to prepare the colored slate for use, over the Monson black slate, that it should sell for less. At the present time, however, the colored slates are bringing practically the same price. By improved methods the cost of the colored slate could be reduced to such a point that it would be more advantageous to use it, with a consequent increase in demand.

Interviews by our engineer with various electrical manufacturers in the Chicago district have substantiated the above statements. It is also found that it is a great deal more difficult for the small manufacturers to obtain slate than it is for such firms as the General Electric Co., Westinghouse, etc., who can afford to send their buyers into the producing field to purchase the slate at its source.

It should easily be possible to dispose of the entire output of a plant producing 100,000 feet of slate per month by yearly contract with firms of good standing, although it would probably be more profitable to dispose of the output in the open market at consequently higher prices.

There is no doubt whatever concerning the demand for finished mill-stock slate for electrical purposes, without even considering the possibilities of stock for billiard tables, structural uses, etc. At the time of our engineer's visit to the plant of the Fair Haven Marble & Marbleized Slate Co., they were manufacturing all of the interior wainscoting, stair treads, etc., for a building being constructed as far away as Saskatoon, Saskatchewan. Reference to the reports of the United States government will show that the export of finished slate is increasing every year.

It should be remembered also that no campaign of education is being conducted for slate as is the case with almost every other material at the present time, such as brick, concrete, roofing, etc.

Users of electrical slate for switchboard purposes have in a great many cases been forced to substitute marble for slate owing to the great difficulty in obtaining slate when needed. This slow delivery, of course, causes additional expense and trouble to the manufacturer of switchboards, and also to his customer, due to correspondence telegrams, etc., made necessary by the delay. One switchboard builder has stated: "The slow deliveries of many of our slate orders have easily cost us ten times as much as the slate itself, and we dare say these same delays have cost our customers even more."

Another manufacturer writes as follows:

> We have your letter of November 2 in which you inquire about the delays and attendant expense to which we have been put owing to the slate situation in the past few months.
>
> You are, of course, well aware just how we stand on this and we cannot put it too strongly that delays incident to transportation difficulties and other delays which we understand have been due to the scarcity of slate have occasioned us considerable expense, annoyance and loss of

prestige with our customers. We aim not so much toward securing this material at the best price, as in serving our customers with the greatest possible dispatch.

CONCLUSIONS AND RECOMMENDATIONS

A close study of the existing conditions in the western Vermont field as shown in the discussion of the mills and quarries, reveals the fact that, in spite of the primitive methods of working, the lack of initiative, and business acumen, all of the plants are operating at a good profit. The credit reports also bear this out.

At the present time, slate is being produced in this field at a total cost of 22 to 30 cents per foot of finished product. This cost is about equally divided between the quarry and the mill.

The report on the J. H. Prince mill shows that the average price obtained for his slate was 67 cents per foot, or a gross profit of about 37 cents per foot if we take the highest cost price.

It must also be borne in mind that these mills are really doing a wholesale business and sell only to the larger manufacturers. The Noel Slate and Manufacturing Co. have a great advantage over any of the mills in their facilities to dispose of slate direct to the user. This is emphasized by the following facts.

The General Electric Co. are now entering into so-called "Instrument Contracts" with switchboard builders all over the United States, and in part consideration of such contracts, they furnish the local builders with complete drawings and manufacturing information; also advising them where slate and other materials may be purchased.

The Westinghouse Electric and Manufacturing Co. are expanding their switchboard business through their service departments, located in the principal cities. These local service departments purchase their own slate.

It appears, therefore, that there will be a steadily increasing, local demand for slate blanks, and that a party carrying complete local stocks will be in a very advantageous position to secure the business. With existing mills and stocks at Chicago, Pentwater, and Toronto, and with others in contemplation, the Noel Slate and Manufacturing Co. are meeting the demands created by the latest policies of the principal electrical interests.

In order to obtain the slate necessary to take care of their present business, and to make the justified expansion in that business, we believe from our detailed study of the conditions in the field that the

following procedure will prove to be extremely profitable, and will offer a safe field for investment, with possibilities of immediate returns:

1. Immediate leasing of the property described in this report, owned and controlled by the Lake Shore Slate Co., and located at West Castleton, Vermont. While this property is not as accessible as might be desired, the slate contained therein is of the best quality, color, and size, and will be in demand when the variegated and green slates will not be accepted. Before completing the lease, we would advise having definite confirmation of the practicability of working this vein by a practical quarryman, preferably, if possible the opinion of a man who might later be given charge of the quarry operations. This is, in the opinion of our engineer, the only available property that will give the amount of slate required, and of the proper quality. All users of electrical slate consulted by us agree that their greatest trouble is due to lack of output at the quarries in the Winter We believe that, on account of the steep dip of the vein on this property, it may prove possible to work it in the French manner, as is now being done in the deposits of vertical cleavage in Maine. This can only be proved by experiments in operation. In any event the water in the present opening should be pumped out before freezing solid, and the pit kept free from water, so as to begin producing slate for the spring business when the other producers are short.

2. Closing of an arrangement with the General Slate Co., or their operator, Mr. Earle, to supply 10,000 feet of purple variegated slate, similar to sample submitted with this report, per month, beginning April 1, 1921. This would insure a mill supply at that time in case it was impossible to open the purple quarry this winter. This would also aid in the immediate accumulation of large stock in your branch mills.

3. The immediate preparing of plans for the construction of a modern slate mill, in the town of Fair Haven, Vermont, with a capacity of 100,000 feet of finished slate per month. Part II of this report is devoted to detail recommendations regarding the design and cost of this mill. We recommend the town of Fair Haven for the mill location on account of its being the center of the labor supply, having banking facilities, and shipping facilities, and being readily accessible for slate-buyers.

4. The investigation and development of a process for molding small switch bases, etc., from slate dust with a possible binder;

these parts to be made with the necessary holes cored in, thus avoiding the expense of drilling. The switchboard engineers of the General Electric Co. were particularly interested in the possibilities of this process.

Conclusion.—It is believed that the construction of a modern building, with proper toilet facilities, a lunchroom, garage, proper heating and ventilating equipment, good floors, and good lighting, will insure a plentiful supply of labor. Such a mill will be able to pick the best labor in the entire district. With the mill located in Fair Haven, labor can be drawn from as far as Rutland on the east and Poultney on the south, as these points are connected by the electric line which gives good service.

Our engineer could not find any evidence in the field of a feeling of antagonism toward this enterprise. Such a feeling really has no basis for existence, as such an enterprise, based upon an output greater than the combined output of all the plants now in the field, should be a greater boost for the entire industry. It may possibly compel those now operating in the field to adopt modern methods, and improve their plants, but this would eventually rebound to their advantage. It would certainly put the slate industry on a firmer business foundation, as it would insure a steady supply of material to the user, and would result in more general use of slate for all purposes. The immediate community would benefit greatly from the increased business activity, the increasing demand for slate, and the consequent rise in property values. An increase in production is always of benefit to a community.

In this connection we wish also to recommend that, if possible, an educational campaign be conducted concerning the properties and uses of slate. There is a great deal of ignorance manifest in all architects' and engineers' offices regarding slate. As it is always black when seen in switchboards, the ordinary engineer believes that only black slate can be used for the purpose, and draws his specifications accordingly. The same is true regarding the use of slate for plumbing purposes. It is believed that if engineers and architects could be educated to specify purple slate that the demand would be greatly increased.

We believe that the fact that the Noal Slate and Manufacturing Co. are in a position to furnish slate cut, beveled, drilled, and finished, to specifications on short notice from stock, gives them an exceptional position in the slate business, as does their policy of carrying standard sizes in stock, for immediate shipment.

Since January, 1916, they have kept a record of the quantities and sizes of slate sold. We have examined this record and we feel that we can readily accept their statement that since March, 1919, approximately 85 per cent of their orders for sizes wider than 12 inches and longer than 24 inches have been for sizes listed in their No. 7 Price List which list includes all of the switchboard sizes which have been standardized by the General Electric and the Westinghouse companies, as well as many other so-called stock sizes.

This suggests, indisputably, the wisdom of a "Milled Stock Department," instead of the heretofore inefficient practice of milling each order separately direct from the rough blocks. We recommend that liberal space be alloted for stock sizes of known activity, the minimum and maximum limits for each size to be determined and revised from time to time, and that mill orders be entered periodically for the replenishing of this stock. This will even up the demands upon the mill and serve as an excellent "balance wheel" at times when the sales curve takes a dip. Strip stock, in widths and thickness of known demand, but in random lengths, should also be carried in stock in liberal quantities, so that orders for small sizes, listed or special, may be produced from such stock by cross-cutting on a carborundum machine.

Detail recommendations for the design of the mill will be given in Part II of this report, but consideration should be given here to the possibility of reducing cost of production, and increasing output by improvements in methods employed. The tabulation of mill data on page 866 shows that the average monthly production per rubbing-bed is 5,335 feet of slate. In all of these plants all of the stock is handled by hand on to and off the machine, and the machine operator does all of his own clamping, lifting, etc. It is agreed by your engineer and ours that this production per bed could easily be increased to 12,500 feet per month with one operator.

Rough stock is now brought in and cut on the saws at an average thickness of 6 to 8 inches. We believe that it will prove practicable to use diamond-tooth saws and increase this thickness to 12 or even 18 inches. This will not only reduce the time and cost of sawing in the mill but also reduce quarry costs by allowing the removal of thicker blocks, thus increasing production at that point. These diamond-tooth saws should be built with two cars, so that while the saw is working on one car the other can be loaded. The plain saw tables used at present are not actually sawing over 25 per cent of the time owing to the handling of material by hand.

The installation of handling machinery will also increase the production of the planers on account of the time saved in setting up the work.

The use of carborundum and diamond saws also increases production by the fact that the cut surface does not have to be finished on the rubbing-bed, as is the case with stock cut by the present steel saws.

All of these increases per machine also operate to cut down the required floor space, and consequently the cost of the building.

We firmly believe that close study in the design and operation of the plant will reduce the cost of manufacture of finished slate from 30 to 40 per cent right at the start, and that further reduction can be made after the plant has been in operation long enough to become standardized.

At present waste is removed from the mills by carts. The installation of conveyors for this purpose, that will remove the waste as it is formed, will increase production by giving greater freedom of movement to the operators, and more available floor space.

Nearly all of the labor in this field is American-born and much above the average in intelligence and ideals. We, therefore, believe that the introduction of some form of bonus or profit-sharing system into both the quarry and mill would result in a much lower cost of production. This should be given serious consideration.

[There follows, in the original report, several pages of photographs of the quarries, etc., mentioned in the preceding pages.]

Part II

[Part I was dated November 19, 1920. This part is dated December 29, 1920.]

This section of the report is devoted:

Section I. To the equipping and opening of a quarry for the production of purple slate and its transportation to the mill.

Section II. To the location of the slate mill.

Section III. To the production layout of the mill.

Section IV. To the complete design of the mill.

Section V. To an estimate of the cost of quarry, transportation, and mill.

Section VI. To the estimate of cost of operation and production, and estimated profits.

Section VII. General discussion.

I. QUARRY

Since the writing of Part I of this report in November, 1920, a lease has been entered into by the Noel Slate and Manufacturing Co. with the Lake Shore Slate Co. covering the property recommended in Part I of the report. This lease calls for a monthly rental of $300.00 for the entire slate rights of property regardless of the amount of slate removed. The old mill, water-power, and houses on this property were not included in the lease, but can be obtained later if it is found desirable.

To the north of the Lake Shore Slate Co.'s property the vein continues on the property of George Phillips and beyond this property the vein runs on the property of one Andrus. It is reported that the vein on these two pieces of property is of equal value with that of the property of the Lake Shore Slate Co. We do not recommend the actual leasing of these two pieces of property at the present time, unless it is found absolutely necessary in order to tie up these rights. If these rights can be obtained under option, this should be done instead of an actual lease being entered into.

Mr. M. R. Johns who was mentioned in the first part of this report has gone over the Lake Shore Slate Co.'s property a second time and advises that the vein should be worked at four openings. There are two openings on the property at present which would mean that two new openings would be necessary.

The water is now being removed from the two old openings by means of pulsometers and an old boiler which was located on the property. The two old openings will therefore be ready for immediate working at any time.

We have had the matter of channeling machines up with the Ingersoll-Rand Co. of Chicago who do not believe that the use of the rail type of channeling machine would prove practicable on this property, due to the narrowness of the vein and the consequent frequent benching required to start new cuts. They do, however, recommend a bar type machine which we would advise trying out after the quarry is started in operation. It may be found, however, by experiment that it will be possible to either use the present standard channeling machine or develop a special machine for this purpose.

It is believed that the only successful method of transporting slate from the quarry to the mill will be by means of motor trucks. The cost of these trucks will be in Section V of this report.

It has been found that electric power in sufficient quantities to operate this quarry is not available at the present time. In order

to obtain power it would be necessary to carry a high tension line approximately five miles and the Rutland Railway Light and Power Co. are at present not in a position to finance this line. It would therefore be necessary for the Noel Slate and Manufacturing Co. to pay for the installation of this extension, which we are advised would cost between $10,000.00 and $13,000.00 including transformers. This amount would, however, eventually be returned by monthly rebates on the power bill.

II. LOCATION OF SLATE MILL

It is recommended that if possible the slate mill be located in the town of Fair Haven, Vermont. This town is the center of the labor supply in this district and is also the center of both banking and shipping facilities. Due to the fact that several of the parties at present operating slate mills in this district are members of the Board of Trade of Fair Haven and to their attitude, indicated in preliminary negotiations, we do not believe that any concessions will be made by the town of Fair Haven in order to have this industry located at that point. The price of the land, however, should not be a serious consideration compared with the entire cost of the enterprise. It might be possible by further negotiations to obtain exemption from taxation for a considerable period.

A piece of former residence property is available for building purposes in the immediate neighborhood of Durick & Keenan and the Old English Quarry Mill, but it is doubtful whether or not this property has sufficient area. Its location is ideal for the purpose intended as it is located adjacent to both the electric and steam railroads, and also to the river for the disposal of waste. We would recommend a careful investigation of this property regarding size, price, etc.

If the property mentioned above does not prove satisfactory, we would recommend the locating of the mill on the eastern edge of town between the electric and steam railroads. The property is readily available in this vicinity.

III. PRODUCTION LAYOUT

The recommended production layout is shown on the accompanying blueprint of drawing No. 703 PA-1. [Omitted—Ed.] It may be found advisable to instal one large roughing-saw at the quarry so that no blocks will be sent to the mill which are too large to be handled on the 8′×10′ saw tables installed in the mill.

Rough stock will be delivered to the mill by motor trucks, from which it will be handled into the yard storage by means of the 5-ton overhead crane. Stock purchased from other quarries will be received on the railroad track and handled to storage by the same crane.

It will be noted that the machinery in the mill is laid out in four distinct units, each independent of the other, but so arranged that stock may be cross fed from unit to unit at any stage of the process.

Stock will be taken either from yard storage or direct from trucks or railroad cars to industrial cars on tracks projecting from building into storage yard. The slate is carried on these cars into the first bay of the building, where it is transferred by overhead crane either onto horses for laying out, into floor storage, or direct onto the first saw tables. By having floor storage at this point, it will not be necessary to keep the outside doors open for stock in cold weather. The electric cranes in this bay are to be operated from the floor by pendant control, so that the man handling the slate will also operate the crane.

Trucks are to be provided with platform at the same height as the tables on the various machines. These trucks will be equipped with roller bearings and can easily be pushed by hand. By means of these trucks, slate is to be transferred from machine to machine, or from machine to storage, or vice versa.

Jib cranes are installed between saws as indicated for handling material from one saw to another, from trucks to saws, or from saws to trucks. A small amount of storage space is available on the floor between saws. A small supply of slate may be stored in this space, either on the floor or on one of the push trucks.

Tongs will be used on jib cranes, and all other hoisting apparatus, for quick handling of blocks. Such tongs are now successfully used in a great many stone quarries and plants.

A considerable storage space is provided between the saws and the planers, so that these are practically independent units. The majority of the slate can be handled by hand when it reaches this point. Extra large, heavy pieces will be so stored that they can be handled by means of the storage battery lift trucks mentioned later in this report.

A storage space is provided after the large planers for planed stock to the rubbing-beds. Material will be handled here the same as in the storage between saws and planers.

Small pieces, which it is necessary to rub on one side before they are planed, will be carried by hand from the rubbing-beds to the small planers located against the wall.

After coming from the rubbing beds, slate will be stored on racks, or skids, which will be handled by means of storage battery lift trucks into the storage space in the finishing department.

Refuse from all machines will be thrown into receptacles located immediately alongside of the machines. These receptacles will be so designed that they can be pushed as trucks, or picked up and carried by storage battery lift trucks. It is estimated that one man can remove, with a lift truck, all of the refuse from the plant.

From the storage in the finishing building slate may be taken either directly to the shipping department, or to any one of the finishing operations by lift truck.

Ample space is provided on shipping platforms, under the yard crane, to allow accumulation and sorting of stock for carload shipments.

All supplies such as lumber, sand, etc., will be received on the railroad track, or by means of trucks, and handled by yard crane.

IV. DESIGN OF THE MILL

The general design of the mill building is shown on accompanying blueprint from drawing No. 703 PA-2. [Omitted—Ed.] The yard crane and storage yard are to be covered with a corrugated iron roof and corrugated iron siding is to be provided down to the top of railroad cars as shown. Floor will be installed under the crane only at the shipping point. The railroad track is depressed under the yard crane so as to bring car floors on a level with shipping platform.

The main building will be of light steel construction with prepared roofing laid on wood. The entire floor area will be well lighted by means of the sash installed in the "A" frame and skylights over the roof. The outside walls will be constructed of brick with steel sash as indicated.

Toilet facilities are provided for both shop and office employees. Two systems of sewers are contemplated, one for sanitary purposes, and the other for the handling of waste from the machines. This latter sewer will be so arranged that abrasive compound used on the machines may be recovered and used over again.

Ample electric lighting is provided throughout.

V. ESTIMATE FOR QUARRY, TRANSPORTATION, AND MILL

QUARRY

Power service	$13,000.00
One air compressor with motor	3,500.00
One air receiver tank	350.00
Air piping	2,000.00
Four air hammers	580.00
Air hose	100.00
Steel for drills	400.00
One drill sharpener, complete	725.00
Six cableways, complete with hoists	44,220.00
Erection, freight, houses, etc.	10,000.00
Total	$74,975.00
Say	$75,000.00

The foregoing figures include only sufficient equipment to open up the quarry. It is believed, however, that the additional equipment required to reach maximum output will consist only of some additional cableways, or derricks, as will develop in course of operation, and possibly some bar-channeling machines. It is believed that the figure of $75,000.00 is amply high to allow the proper beginning of operations.

TRANSPORTATION

As is shown later, under estimate for mill, 200,000 feet of slate per month must be transported to the mill, or 8,000 feet per day, figured on the basis of 25 working days per month. As one board foot of slate weighs approximately 15 pounds, one day's supply of 8,000 feet will weigh approximately 60 tons. It is estimated that a 3-ton motor truck could make the round trip from quarry to mill in two hours, or four trips per day of eight hours. This would give a capacity of 12 tons per day, and five trucks would be required to give the necessary 60 tons per day. These five trucks should be secured for a total of $20,000.00.

Sometime during the first year, probably at the approach of winter, a sixth truck should be secured on account of the more difficult operating conditions, and to allow the withdrawal of one truck at a time for repairs.

MILL

Capacity.—100,000 feet of finished slate per month. (All measurements are in board feet.)

Waste.—50 per cent between rough and finished stock.

Rough stock.—200,000 feet per month.

Average size of rough stock.—4′0″×8′0″.

Average size of finished piece.—2′0″×4′0″.

Largest size of finished piece.—4′0″×7′0″.

Average content of rough piece.— 64 feet.

$\frac{200,000}{64}$ = 3,125 pieces of rough stock per month.

125 pieces per day (25 days per month).

$15\frac{5}{8}$ pieces per hour, or 1 piece every 3.8 minutes, from yard storage to first saws.

RUBBING-BEDS, SAWS, AND PLANERS

Investigation of all the present plants in the field shows an average output of 5,335 feet of finished slate per month per rubbing-bed. This should easily be increased by proper handling methods to 12,500 feet per month. Eight rubbing-beds will therefore be required for a monthly output of 100,000 feet of finished slate.

Present plants show a ratio of two and three-fourths saws per rubbing-bed. Fifty-five saws are giving a present output of 106,700 feet of finished slate per month, or 1,940 feet per saw, per month. This should easily be increased to 4,000 feet per month. With an output of 12,500 feet per month, three saws will be required per rubbing-bed, or a total of twenty-four saws. Consultation with operators and manufacturers, and investigation of the following table [omitted—Ed.], shows that these saws should be 4′6″×8′0″, 6′0″×10′0″, and 8′0″×10′0″.

Present plants show a ratio of 2.15 planers per rubbing-bed. Forty-three planers are giving a present output of 106,700 feet of finished slate per month, or 2,481 feet per planer, per month. This should be increased to at least 4,000 feet per month. With an output of 12,500 feet per month for each rubbing-bed, three planers per bed will be required, or a total of twenty-four planers. Consultation with operators and manufacturers, and investigation of the following table [omitted—Ed.], shows that these planers should be 3′6″×7′0″, 4′0″×8′0″, and 5′0″×10′0″.

ESTIMATE OF EQUIPMENT FOR MILL

No. Required	Item	Cost	
1	5-ton, 3-motor yard crane	$ 6,500.00	
4	24-inch gauge tracks, each 30 feet long	150.00	
4	Industrial cars	600.00	
8	Saw tables, 8′0″×10′0″	14,900.00	
8	Saw tables, 6′0″×10′0″	12,600.00	
8	Saw tables, 4′6″×8′0″	10,300.00	
8	Planers, 5′0″×10′0″	10,100.00	
8	Planers, 4′0″×8′0″	8,820.00	
8	Planers, 3′6″×7′0″	8,400.00	
8	12′0″ diameter rubbing-beds	14,400.00	
2	2-ton, 3-motor cranes	8,000.00	
4	Jib cranes, 24-foot radius, 2000 lb.	3,000.00	
4	Jib cranes, 24-foot radius, 1000 lb.	2,800.00	
4	Jib cranes, 18-foot radius, 2000 lb.	2,800.00	
4	Jib cranes, 18-foot radius, 1000 lb.	2,400.00	
50	Special push trucks	6,250.00	
3	12-foot carborundum machines	6,000.00	
1	Carborundum beveling machine	2,000.00	
15	Drill presses	5,000.00	
2	Belt sanding machines	2,000.00	
2	Air brush outfits, complete	400.00	
3	Chipping hammers	200.00	
1	7″×6″ air compressor and motor	1,200.00	
1	Air receiver tank	100.00	
1	Oven complete	3,000.00	
1	Dipping tank	250.00	
	Toolroom equipment	500.00	
4	Storage battery lift trucks	12,000.00	
1	Battery charging outfit	500.00	
	Office equipment	2,000.00	
	Box-making machinery	1,000.00	
	Storage racks	2,000.00	
	Refuse receptacles	1,500.00	
	Erection, freight, etc.	10,000.00	
	Shafting and belting	5,000.00	
	Motors	10,000.00	
	Total	$176,670.00	
	Say		$178,000.00

ESTIMATE OF BUILDING

Building 200′×240′, or 48,000 sq. ft.		
Concrete, brickwork, etc.	$41,800.00	
Carpentry	19,200.00	
Structural steel, skylights, glazing	55,000.00	
Painting, hardware, roofing, etc.	8,000.00	
Heating	17,000.00	
Electric lighting	3,000.00	
Plumbing and drainage	9,000.00	
Power wiring	11,000.00	
Insurance and general conditions	6,000.00	
Total		$170,000.00

CRANEWAY

40′×240′, or 9,600 sq. ft.		
Concrete, etc.	$ 7,600.00	
Carpentry	200.00	
Steelwork, sash, glazing, etc.	22,100.00	
Painting	300.00	
Insurance and general conditions	1,800.00	
Total		$ 32,000.00

GENERAL SUMMARY OF ESTIMATES

Quarry	$ 75,000.00	
Auto trucks	20,000.00	
Land for mill	5,000.00	
Mill building	170,000.00	
Covered craneway	32,000.00	
Switch track	3,000.00	
Complete boiler plant	13,000.00	
Machinery foundations	5,000.00	
Electric power supply	3,000.00	
Machinery	178,000.00	
Engineer's fee	51,000.00	
Total		$555,000.00

While the estimate given is for a plant capable of producing 100,000 feet of finished slate per month, we would advise installing only one unit of machinery at the beginning. This will not only allow a thorough trial of the equipment and method of operation, but will also establish a source of income before the total expenditure is made. We also advise omitting the covered craneway and crane until all of the machinery is installed and the plant operating to

capacity. By leaving out the concrete floor in the three bays in which machinery is not to be installed at once, this space would serve as a covered storage, and the trucks could be driven directly into the building and unloaded with the electric crane in the first bay. The boiler plant and heating equipment could also be omitted, at least until winter.

The foregoing procedure would require the following list of equipment for immediate installation:

No. Required	Item	Cost
1	24-inch gauge track, 30 feet long	$ 37.50
1	Industrial car	150.00
2	Saw tables, 8′0″×10′0″	3,725.00
2	Saw tables, 6′0″×10′0″	3,150.00
2	Saw tables, 4′6″×8′0″	2,575.00
2	Planers, 5′0″×10′0″	2,525.00
2	Planers, 4′0″×8′0″	2,205.00
2	Planers	2,100.00
2	12′0″ diameter rubbing-beds	3,800.00
1	2-ton, 3-motor crane	4,000.00
1	Jib crane, 24-feet radius, 2000 lb.	750.00
1	Jib crane, 24-feet radius, 1000 lb.	700.00
1	Jib crane, 18-feet radius, 2000 lb.	700.00
1	Jib crane, 18-feet radius, 1000 lb.	600.00
15	Special push trucks	1,875.00
1	12-foot carborundum machine	2,000.00
1	Carborundum beveling machine	2,000.00
4	Drill presses	1,500.00
1	Belt sanding machine	1,000.00
1	Air brush outfit, complete	200.00
2	Chipping hammers	140.00
1	7″×6″ air compressor and motor	1,200.00
1	Air receiver tank	100.00
1	Oven complete	3,000.00
1	Dipping tank	250.00
	Toolroom equipment	500.00
1	Storage battery lift truck	12,000.00
1	Battery charging outfit	500.00
	Office equipment	2,000.00
	Box-making machinery	1,000.00
	Storage racks	500.00
	Refuse receptacles	400.00
	Erection, freight, etc.	4,000.00
	Shafting and belting	2,000.00
	Motors	4,000.00
	Total	$67,182.50
	Call this	$68,000.00

Building items omitted would be as follows:

Covered craneway	$32,000.00
Complete boiler plant	13,000.00
Machinery foundations	3,000.00
Heating equipment	17,000.00
Power wiring	6,000.00
Total omissions	$71,000.00

The general summary of estimates for immediate expenditure would therefore be:

Quarry	$75,000.00
Auto trucks	20,000.00
Land for mill	5,000.00
Mill building	147,000.00
Switch track	3,000.00
Machinery foundations	2,000.00
Electric power supply	3,000.00
Machinery	68,000.00
Engineer's fee	32,300.00
Total	$355,300.00

We have not recommended cutting down the investment for quarry or trucks, as we believe that the quarry should be opened to capacity while the mill is being tried out and developed.

VI. COST OF OPERATION AND ESTIMATED PROFITS

With the equipment recommended for the quarry, we do not believe that the cost of producing quarry stock can be reduced to any considerable extent below the cost in the present quarries. It will probably be possible to reduce this cost to some extent later on by possible developments of machinery, but we do not believe that for the purpose of this report that a lower cost should be considered.

The table on page 866 of Part I of this report shows a total of 103 employees in the present quarries, for a production of 106,700 feet of *finished* slate per month, or 1,035 feet per employee. It must be remembered however that some of these men are engaged in taking out roofing-slate, which is not considered in the 106,700 feet of mill stock. Also, there are a certain number of men employed as foremen, etc., who will not be required in this single quarry. We believe that 100,000 feet of finished slate per month can be removed from the quarry with a maximum of 40 men.

MONTHLY COST OF QUARRY STOCK

(25 working days—8 hours per day)

Labor, 40 men at 60 cents per hour	$4,800.00
Power	1,000.00
Rent of quarry property	300.00
Interest ($75,000 at 8 per cent per year)	500.00
Depreciation at 10 per cent per year	625.00
Overhead	750.00
Total	$7,975.00

These figures indicate an approximate cost of $0.08 per foot of finished slate for mill stock at the quarry.

MONTHLY COST OF HAULING

Five trucks, each making four trips per day of approximately 10 miles per round trip, at a total cost of 40 cents per mile, per truck.

Total cost per month, $2,000.00.

This gives a cost of $0.02 per foot of finished slate.

MONTHLY COST OF MILLING

It is estimated that the mill as laid out, when operating at full capacity, can be run by a force of eighty men.

Labor, 80 men at $0.60 per hour	$9,600.00
Power	1,500.00
Heating	650.00
Interest on investment ($460,000 at 8 per cent per year)	3,067.00
Interest on working capital ($100,000 at 5 per cent per year)	668.00
Depreciation (10 per cent per year on $460,000)	3,833.00
Supplies	500.00
Maintenance	500.00
Overhead	2,500.00
Total	$22,818.00

With a production of 100,000 feet per month the foregoing gives an approximate cost of $0.23 per foot of finished slate for milling and finishing.

TOTAL COST OF SLATE

Quarry	$0.08
Hauling	.02
Milling and finishing	.23
Total	$0.33 per foot

While Part I of this report states that the average cost of slate in the field is $0.30 per foot, this is believed to be too low for total cost, as we do not think that the cost of production is at present actually known, and do not think that interest, depreciation, etc., are included in that figure. It should also be noted, that while the selling price is given in Part I at $0.67 per foot, this applies to slate as it comes from the rubbing-bed, while the cost given above includes the entire cost of finishing, drilling, and crating. For this reason the selling price of slate from this mill will actually be greater than $0.67 per foot, but to be conservative the profits are estimated on a selling price of $0.67 per foot.

PROFITS

On the foregoing basis the estimated profits of this enterprise would be as follows:

While the plant will be capable of producing 100,000 feet per month for 1,200,000 feet of finished slate per year, we will base our figures on sales of 1,000,000 feet per year to allow for possible shut down, and an accumulation of finished stock.

Sales, 1,000,000 feet at $0.67	$670,000.00
Cost at $0.33 per foot	330,000.00
Profit	$340,000.00

A profit of $340,000.00 is equal to 61 per cent on an investment of $555,000.00.

A profit of $340,000.00 is equal to 50 per cent on sales of $670,000.00.

We believe the foregoing figures to be extremely conservative.

VII. GENERAL DISCUSSION

The plant shown on the drawings accompanying this report [Omitted—Ed.] is a typical layout, made without consideration of

the property on which the plant will be built. It is not to be considered as a final design as the completed plant will depend in detail upon the ground and surrounding conditions. The estimates given, however, will amply cover any possible change in design.

It is believed that experiments now being made will prove the advisability of designing special machinery, or adapting other existing machinery to this industry with great financial benefit. Such possibilities however, have not been considered in this report.

DECEMBER 29, 1920

LANE AND LANE
BY J. C. LANE

B. The Accountant's Report

December 1, 1920

Noel Slate and Manufacturing Co.
M. C. Noel, President,
1318 East 56th St.,
Chicago, Illinois.

DEAR SIR: In accordance with your request, we have audited the books of account of the Noel Slate and Manufacturing Co. for the period July 1, 1920, to October 31, 1920, and are submitting our report, herewith, accompanied by the following exhibits and schedule:

EXHIBITS

I. BALANCE SHEET, OCTOBER 31, 1920
II. SURPLUS ACCOUNT STATEMENT
JANUARY 1, 1920, TO OCTOBER 31, 1920
III. PROFIT AND LOSS STATEMENT
JANUARY 1, 1920, TO OCTOBER 31, 1920

SCHEDULE

A. CUSTOMERS ACCOUNTS RECEIVABLE

CERTIFICATION

We certify that we have made a careful examination of the books of account and other corporate records of the Noel Slate and Manufacturing Co. for the period ended October 31, 1920, and that Exhibit I (Balance Sheet) is indicative of the true financial condition of the Company as at the close of business on said October 31, 1920, subject to verification of separate balance sheet items as covered by subsequent comments.

Respectfully submitted,

SMITH AND JONES
Certified Public Accountants

JFS*K

EXHIBIT I

Balance Sheet

October 31, 1920

RESOURCES

Current:		
Cash on hand and in bank	$ 1,058.21	
Liberty Bonds	400.00	
Customers' accounts receivable (Schedule "A")	24,447.95	
Merchandise inventory	9,011.12	
		$34,917.28
Deferred:		
Stock in other corporations	$10,000.00	
Trade acceptances receivable—discounted	2,207.11	
Sundry accounts receivable	716.34	
Accrued interest	8.52	
Contracts, etc.	1.00	
Deferred charges to operation	307.11	
		13,240.08
Fixed:		
Buildings	$ 5,333.75	
Machinery	8,476.59	
Furniture and fixtures	1,068.04	
Automobile	750.00	
	$15,628.38	
Less: reserve for depreciation	5,425.14	
		10,203.24
TOTAL		$58,360.60

LIABILITIES

Current:		
Bank loans payable	$ 1,800.00	
Trade acceptances payable	4,353.93	
Creditors' accounts payable	10,737.18	
Customers' allowances	33.11	
Accrued pay-roll	265.90	
		$17,190.12
Deferred:		
Sundry notes payable	$ 1,000.00	
Sundry accounts payable	214.46	
Accrued liabilities	142.30	
Trade acceptances receivable—discounted	2,207.11	
		3,563.87
Total		$20,753.99
Capital:		
Capital stock outstanding	$20,000.00	
Surplus (from Exhibit II)	17,606.61	
		37,606.61
TOTAL		$58,360.60

EXHIBIT II

Surplus Account Statement

January 1, 1920, to October 31, 1920

DISTRIBUTION		
Jan. 1, 1920, deficit	$ 1,955.21	
Oct. 31, 1920, surplus (to Exhibit I) Subject to 1920 federal taxes	17,606.61	
Total		$19,561.82
ADDITIONS		
Oct. 31, 1920, sundry adjustment	$ 1.00	
Oct. 31, 1920, net profit for period (from Exhibit III)		
Chicago factory $10,408.81		
Pentwater factory 9,152.01		
	19,560.82	
Total		$19,561.82

EXHIBIT III

Profit and Loss Statement

January 1, 1920, to October 31, 1920

Expenditures	Chicago	Pentwater
Cost of goods sold:		
Merchandise inventory, Jan. 1, 1920—Est.	$ 8,000.00	$ 3,000.00
Merchandise purchases	31,906.99	4,980.97
Freight charges	2,344.83	417.30
Direct labor	4,207.91	8,008.93
	$46,459.73	$16,407.20
Less: inventory, Oct. 31, 1920—Est.	6,889.39	2,121.73
	$39,570.34	$14,285.47

Expenditures	Chicago	Pentwater
Factory expenses:		
Executive salary	$ 2,100.00	.....
Superintendent's salary	.....	$ 2,136.08
Inter-factory freight	.....	603.74
Crating material	475.09	1,496.47
Ground rent	350.00	.....
Fuel, light, and power	392.87	1,076.53
Shop supplies and expense	2,339.85	2,000.15
Insurance	61.52	162.31
Depreciation—buildings	227.20	285.79
Depreciation—equipment	210.29	496.09
	$ 6,156.82	$ 8,257.16
Selling expenses:		
Executive salary	$ 2,100.00	$ 1,850.00
Advertising	1,456.58	130.00
Cartage	1,655.77	426.67
Auto expense	619.98	.....
Depreciation—automobile	125.00	.....
	$ 5,957.33	$ 2,406.67
Administrative expenses:		
Executive salary	$ 3,048.15	$ 2,406.85
Superintendent's salary	.....	2,136.08
Office salaries	699.61	410.89
Traveling expenses	920.62	540.68
Life insurance—officers	303.60	60.95
Printing and stationery	288.22	169.28
Telephone and telegraph	126.91	74.54
Postage	90.77	53.30
Collection and legal expense	97.35	57.18
Discount allowed	584.75	343.42
Interest paid	672.27	394.83
Bad debts	119.98	.....
Taxes	147.88	.....
Other sundry expenses	275.92	162.05
Depreciation—fixtures	87.73	1.27
	$ 7,463.76	$ 6,811.32
Total	$59,148.25	$31,760.62

Expenditures	Chicago	Pentwater
Net profit for period (to Exhibit II)		
Subject to 1920 federal taxes	$10,408.81	$ 9,152.01
TOTAL	$69,557.06	$40,912.63
Sales: Income Accrued		
General	$69,338.60	$39,405.01
Inter-factory	406.00	2,190.85
	$69,744.60	$41,595.86
Less: returns and allowances	668.00	962.45
Net sales	$69,076.60	$40,633.41
Miscellaneous income:		
Recoveries through claims	$ 293.35	$ 172.29
Discount earned	135.42	79.54
Interest earned	46.63	27.39
Sundry income	5.06	.....
	$ 480.46	$ 279.22
TOTAL	$69,557.06	$40,912.63

SCHEDULE "A"

CUSTOMERS ACCOUNTS RECEIVABLE

October 31, 1920

[It is not necessary to give the details of this list. There were 43 firms represented in the list, with a total of $24,447.95. The accounts were all "good," and no single firm owed more than $2,700.]

COMMENTS

Cash, $1,058.21.—This total was distributed as follows:

Hamilton State Bank	$558.21
Cash on hand	500.00
Total	$1,058.21

Canceled checks for the four-months period ended October 31, 1920, were examined, bank balance employed reconciled with certification of the Hamilton State Bank, and cash on hand together with November receipts verified as to their subsequent deposit up to and including November 20, 1920.

Liberty bonds, $400.00.—These bonds were submitted for our inspection and found to represent four one-hundred-dollar bonds of the fourth $4\frac{1}{4}$ Liberty issue.

Customers accounts receivable $24,447.95.—A careful examination was made of all outstanding accounts and is reflected in detail by Schedule "A." This schedule also discloses the class of customers and territory served, and we found very few unpaid invoices dating over sixty days. An investigation was made as to unfilled orders on hand as at November 18, 1920, and the invoicing total verified to be $13,770.47. These orders were distributed for shipment as follows:

Chicago factory		
Westinghouse Electric and Manufacturing Co.	$2,596.85	
Other customers	4,416.93	$ 7,013.78
Pentwater factory		948.70
Direct quarry shipments		5,807.99
Total		$13,770.47

All of the foregoing orders were verified with customers original purchase requisitions.

Merchandise inventory, $9,011.12.—Many difficulties arise in the determination of an accurate inventory at either cost or market value. Although it is true, that a physical listing might be made of the Chicago stock, the individual identity of the various slabs with original purchase invoice is not possible, due to cutting and resizing. The salvage of what is termed "scrap" is dependent solely upon the demand for small sizes. Still greater difficulties are encountered in computing the merchandise inventory of the Pentwater factory. The principal service of supply at this point is from the Brunswick-Balke-Collender Co. on a contract basis computed per square foot on what is termed "Rejects and Spoils." Cuttings of electrical slate procurable from these slabs vary and the identity of the cost per carload is lost upon its first sorting at the plant. We have adopted Mr. Noel's plan of computing the inventory on the following basis:

Inventory, January 1, 1920 (Est.) plus merchandise purchases (January 1, 1920, to October 31, 1920), less cost of merchandise sold.

Cost of merchandise sold has been determined on the following plan:

Chicago: $\frac{1}{2}$ of net sales for period.
Pentwater: $\frac{1}{6}$ of net sales for period.

There is little question as to the comparative accuracy at Chicago, as it is the practice to double the "Vermont list price" on sales. The ratio employed on Pentwater inventory is conservative and we are assured by the president, Mr. M. C. Noel, that the final total of this asset is extremely low. It may be noted that the inventory at the close of the period represents a decrease of $1,988.88 under January 1, 1920.

Stock in other corporations, $10,000.00.—This represents the outstanding capital stock of the Noel Slate and Manufacturing Co. of Canada, Ltd., of which ninety-five shares ($9,500.00) have been originally issued to the Noel Slate and Manufacturing Co., as attested by Williams and Williams of Toronto, Canada, solicitors for the Canadian Company, and the remaining five shares ($500.00) indorsed over to the Illinois Corporation, as verbally stated by Mr. Noel, president. The statement submitted by Mr. W. G. Rightmire, manager at Toronto, Canada, on October 31, 1920, indicates a present book value of $101.28 per share on this stock.

Trade acceptances receivable—discounted, $2,207.11.—This figure is verified by letter of Hamilton State Bank under date of November 20, 1920, and covers four acceptances, all maturing prior to December 28, 1920. The practice of discounting customers' paper immediately is followed in practically all instances.

Sundry accounts receivable, $716.34.—This amount is composed of the following personal and sundry items:

M. C. Noel, president	$ 17.71
O. L. Lester, secretary	35.00
Due from carriers	290.99
Due from government	12.50
Noel Slate and Manufacturing Co. of Canada	360.14
Total	$716.34

The first two items are overdrafts against officers' salary accounts. The item of $290.99 covers three loss and damage claims against common carriers, all of which were paid during November. A claim for refund has been filed with the collector of internal revenue for rebate of $12.50 on account of excess payment on 1918 corporation income taxes. The account against the Canadian factory is for merchandise and the present level of exchange has deterred its settlement.

Accrued interest, $8.52.—This is the interest on Liberty Bonds held due October 15, 1920.

Contracts, etc., $1.00.—At the request of Mr. M. C. Noel, president, we have set up the nominal value aforestated on the contract entered into between the Brunswick-Balke-Collender Co. of Michigan and the Vermont and Pennsylvania Slate Co. on June 20, 1916, for a period of ten years and assigned to the Noel Slate and Manufacturing Co. August 19, 1918. This contract provides for the delivery of all slate slabs known as "Rejects and Spoils" to the Pentwater plant at a price per square foot, subject to adjustment every three years. This adjustment is dependent upon the market value of slate prevalent. This contract also places sufficient land at their disposal for operations at a nominal ground rent of five ($5.00) dollars per annum. From past observation, Mr. Noel states the minimum price considered for the sale of the remaining term of the contract would be $10,000.00. In passing, we also draw attention to the ground lease from the Taylor Marble Co., the value of the remaining term being, however, of a speculative nature.

Deferred charges to operation, $307.11.—This is made up of the two appended items:

Development expense	$250.00
Unexpired insurance	57.11
Total	$307.11

The development expense listed is in conjunction with the proposed Vermont quarry and factory, covering advance made to resident engineer retained at Fair Haven, Vermont. All insurance policies on hand were examined and unearned premiums determined therefrom. Insurance carried is workmen's compensation, auto liability, and fire to the amounts of $4,000.00 at Chicago and $2,000.00 at Pentwater, Michigan. Policies in favor of the Corporation are also carried on the lives of M. C. Noel and T. E. Muir in the amounts of $5,000.00 and $2,500.00 respectively. There are ordinary life-policies taken out in May, 1919, and have, therefore, no cash surrender value as at the date of this report.

Fixed assets, $10,203.24.—Initial charges and subsequent additions to these accounts have been entered upon the books of account at cost and sufficient reserves set up to cover depreciation sustained.

The Chicago factory is a one-story brick building (20′×70′) erected in 1915 on land sub-leased from the Taylor Marble Co.,

September 1, 1915, for a ten-year period. The Pentwater factory was also erected on leased ground and is a one-story cement block structure built in 1916 and turned over to the Noel Slate and Manufacturing Co. two years later. Depreciation has been allowed against these assets with a view toward their extinguishment by August 31, 1925, and June 19, 1926, respectively. A depreciation of 10 per cent per annum has been allowed against the machinery and fixtures account. The automobile is a 1917 Buick roadster purchased in the fall of 1919, on which we have estimated the life at five years. We are appending a table indicating the depreciation charged against each class of asset since date of acquirement to October 31, 1920, inclusive:

Description	Cost	Depreciation	Percentage	Net
Buildings	$ 5,333.75	$2,204.07	41	$ 3,129.68
Machinery	8,476.59	2,699.35	32	5,777.24
Fixtures	1,068.04	396.72	37	671.32
Automobile	750.00	125.00	17	625.00
Total	$15,628.38	$5,425.14	35	$10,203.24

Bank loans payable, $1,800.00—This amount covers total direct liability to the Hamilton State Bank, as set forth in their verification of November 20, 1920.

Trade acceptances payable, $4,353.93.—The distribution and maturity of these acceptances are as follows:

Date Given	Creditor	Date Due	Amount
August 9, 1920	Conrad Slate Co.	November 9, 1920	$1,096.05
August 24, 1920	Conrad Slate Co.	November 24, 1920	1,207.76
September 10, 1920	Conrad Slate Co.	December 9, 1920	361.24
September 10, 1920	Amos Slate Works	December 10, 1920	124.46
October 10, 1920	Stevens Slate Co.	December 10, 1920	257.79
September 24, 1920	Conrad Slate Co.	December 22, 1920	328.75
September 30, 1920	Conrad Slate Co.	December 29, 1920	385.11
October 10, 1920	Stevens Slate Co.	December 29, 1920	592.77
Total			$4,353.93

Written confirmation of the foregoing totals was secured from creditors on all of the foregoing items with the exception of $124.46 due the Amos Slate Works.

Creditors' accounts payable, $10,737.18.—A careful examination was made to ascertain all liabilities under this caption by reference

to statements on hand and written verification from the larger creditors. We have included all known liabilities as of this date in our total figure. The present practice is to discount bills or settle on the creditors regular terms of thirty days net.

Customers' allowances, $33.11.—This covers sundry refunds due customers on overcharges and allowances.

Accrued pay-roll, $265.90.—This is the total pay-roll at the Pentwater factory for week ending October 30, 1920.

Sundry notes payable, $1,000.00.—This represents the balance of various loans from Mr. C. E. East, which are rapidly approaching liquidation. Interest charges thereon have been paid promptly.

Sundry accounts payable, $214.46.—This is the unpaid balance to the credit of Mr. T. E. Muir, superintendent at the Pentwater plant as of October 31, 1920, on salary and bonus account.

Accrued liabilities, $142.30.—We have endeavored to include all liabilities incurred on which no invoice has yet been rendered, and the foregoing figure covers the total of accruals for power, taxes, etc.

Trade acceptances receivable—discounted, $2,207.11.—The Hamilton State Bank has confirmed this contingent liability.

Capital, $37,606.61.—The stock certificate book and corporation record were submitted for our inspection. The authorized capitalization is $20,000.00, consisting of two hundred shares of par value of $100.00 each. All the stock is outstanding and with exception of required nominal issues held by the president, Mr. M. C. Noel. Present officers and annual compensation authorized are as follows:

M. C. Noel	President Treasurer	$12,000.00
O. L. Lester	Secretary Assistant Treasurer	2,600.00

The Company was incorporated under the laws of Illinois on August 5, 1914. This report indicates a present book value of outstanding stock of $188.03 per share.

PROFIT AND LOSS

The detailed operating statement for the ten-months period is set forth in Exhibit III. This statement shows the operations of the Pentwater and Chicago factories individually, and certain of the administrative expenses have by necessity been charged on a pro rata basis. We have made this division on a percentage derived from the ratio of net sales of the two factories to total sales, viz:

	Percentage
Chicago	63
Pentwater	37
Total	100

The appended table is an interesting reflex on operations for the ten-months period, setting forth the percentage of profits on gross income.

	Percentage	
	Chicago	Pentwater
Cost of goods sold	56.9	34.9
Factory expense	8.8	20.2
Selling expense	8.6	5.9
Administrative expense	10.7	16.6
	85.0	77.6
Net profit	15.0	22.4
Total	100.0	100.0

Various analyses and tests were made as to the integrity of this operating statement.

GENERAL

We are submitting the following table of earnings and sales from incorporation to October 31, 1920:

Year	Net Sales	Net Profit and Compensation of M. C. Noel	
1914	$ 2,399.51	Loss (5 mo. only)	
1915	24,036.05	$ 712.38	
1916	30,265.51	3,687.89	
1917	36,109.14	4,172.87	
1918	91,314.25	14,714.70	
1919	52,599.14	4,820.75	
1920	107,113.16	29,560.82	(10 mo. only)
Total	$343,836.76	$57,669.41	

The loss in 1914 is attributed to the initial establishment of the Company. Inasmuch as this is a close corporation, in which no one other than Mr. M. C. Noel is vitally interested, we believe the earnings to be more equitably set forth by combining the net profit with drawings of the president. The low figure in 1919 is due to inability to secure raw material and the marked increase during the current year to the utilization of "tailings" and "scrap" on numerous orders for small sizes. As stated elsewhere, the market value of this class of material is dependent solely upon the demand.

HISTORICAL

On July 1, 1914, Mr. M. C. Noel resigned from the position of western manager of the Conrad Slate Co., of Hydeville, Vermont, and opened an office at 1318 East 56th Street, Chicago, marking the beginning of the organization of the Noel Slate and Manufacturing Co. Application for incorporation was made and granted by the State of Illinois August 5, 1914, the initial capitalization being $2,500.00. On September 1, 1915, ground was sub-leased from the Taylor Marble Co. and present factory erected that fall. In May, 1916, the capitalization was increased to $10,000.00 due to the growth of the business. In June, 1918, Mr. Noel turned over the Vermont and Pennsylvania Slate Co. of Pentwater, Michigan, a co-partnership, to the Noel Slate and Manufacturing Co. at a net value of $5,077.51, a figure computed on cost and the capitalization was further increased to $20,000.00. The present financial status of the Company is clearly set forth in the accompanying balance sheet.

C. The Prospectus

NOEL SLATE AND MANUFACTURING COMPANY

Incorporated in Illinois, August 4, 1914

Head Office: 1318 East 56th Street, Chicago, Ill.

Tangible assets (net worth) December 31, 1920 (approximately)	$ 40,000.00
Conservative value of contracts, leases, and Good Will	75,000.00
	$115,000.00
Proposed increase	$500,000.00

CHARACTER OF BUSINESS

This Company has been doing a general slate business, including the merchandising of stock sizes, the milling and finishing of special sizes, and the fabrication and erection of slate interiors and fixtures for the building trade. The principal specialty has been slate for electrical purposes.

The slate business is particularly steady and constantly growing; it is not affected by fad or fashion; the demand is even more constant than for building materials in general and it is reasonably sure to keep pace with the electrical industry at large; no commercially feasible or cheaper substitute for slate is known, whereas it is cheaper than marble and better than marble for a great many purposes on account of being non-porous and stronger.

The electrical industry alone affords a large and constantly increasing market for slate. Marble is becoming obsolete for switchboards and slate is taking its place. Slate is used almost exclusively for mounting the details of controlling apparatus, rheostats, switches, and numerous other electrical devices.

Our business has had a steady growth during the past six and one-half years, and has shown large profits on a relatively small invested capital. But these results are not sufficient criteria for estimating profits from our proposed new developments, for the reason that many of the limitations under which we have been working will be removed as soon as our quarry developments and Fair Haven Mill are completed.

The limitations referred to may be summed up as follows:

1. Loss of business due to scarcity of slate and consequent inability to meet desired deliveries.

2. Abnormal loss from the resizing of existing stocks.

3. The frequent payment of premiums for raw material at times when our own facilities were over-sold.

4. The large number of incoming less-than-carload shipments.

5. Loss of prestige with certain customers whose business we could not take care of promptly or properly.

There has been an insistent and yet patient demand for slate—a demand that has been grossly ignored by most of the producers in that they either have not seen or have neglected their opportunity to meet the demand by modernizing their plants and their business methods. Fortunately for the industry, as far as its future is concerned, there has been no available or satisfactory substitute for slate. Hence, it is not too late to reclaim the ground that has been lost. We expect to meet the demand by adding prompt and efficient service to inherent values.

Without the slightest egotism and without the possibility of contradiction, the Noel Slate and Manufacturing Co. is the only slate concern *not of the old school.* Practically all of our competitors have been "born and raised" in the business, and possibly because of the absence of any aggressive competition they have been content to plod along in the same old rut—good slate men in their own way, but minus the business acumen and initiative which alone can impel growth and increasing profits. Satisfied with being over-sold, they have not seen the commercial advantages of making "spot" deliveries, nor of modernizing their plants in order to obtain constantly decreasing costs.

With a stock of active sizes (finished and semi-finished) equal to one or two months' output, the possibility of a shut-down due to accidents or labor troubles, would not be a serious matter in comparison with a competitor having no finished or semi-finished stock on hand.

THE DEMAND FOR ELECTRICAL SLATE

If evidence is wanted of the uses of and demand for electrical slate, one has only to turn the pages of any of the several periodicals which are devoted to the commercial and engineering phases of the electrical business such as: *The Electrical World*, New York; *The Electrical Review*, Chicago; *The Electrical Record*, New York; *The Electric Journal*, Pittsburgh; *Journal of Electricity*, San Francisco; *The Electrical News*, Toronto, Canada; *Journal of the American Institute of E E*, New York; *Electrical Merchandising*, New York.

These publications abound in illustrations of electrical and allied appliances which are mounted on slate bases or backs.

There are vast industries for the production of a wide range of measuring, indicating, recording, and testing instruments, the sale of which must necessarily be attended by the sale of slate blanks upon which to mount them. Obviously the demand for slate will always be somewhat proportional to the sale of these instruments.

At the present time, many of the principal users of electrical slate have large orders placed with producers of an inferior product, simply because they cannot obtain their requirements from their favorite source.

THE FUSE INDUSTRY

It is a well-known fact that the fuse business has become a vast one, there being at least ten large manufacturers of these small but important devices, and the business is still growing.

Nearly all makers of fuses are large buyers of slate.

Nearly all users of fuses are users of slate.

Hence, the growth of the electrical slate business has been and will continue to be somewhat proportional to the growth of the fuse business, as well as to the growth of other branches of the electrical industry.

THE GROWTH AND SUCCESS OF OUR BUSINESS

The growth and success of our business may be definitely laid to the following main causes:

1. The growth of the electrical industry at large.

2. The loyal and efficient services of our entire personnel, and especially of the superintendents of our several factories.

3. Our never ceasing effort to keep in stock as many as possible of the standard and active sizes of slate, thereby out-classing all competition in the matter of deliveries.

4. Our unimpeachable price policy, which had its inception in January, 1916, when we published the first *piece* price-list, thereby following the lead of the window-glass industry. For nearly five years we were the exclusive publishers of such a list as applied to slate, while the only other list which has since made its appearance is much inferior to our current list in many important respects.

5. The development of a large business for small sizes of slate thereby enabling us to make advantageous and profitable use of the salvage ends and tailings from larger slabs.

6. The proximity of our Chicago, Pentwater, and Toronto factories to large markets for electrical slate.

7. The persistent but conservative amount of publicity, as compared with practically no advertising on the part of our competitors.

8. The closest possible attention to inquiries, orders, and all correspondence.

The manufacture of electrical devices designed for mounting on slate is of itself a prodigious industry, being represented by well-known and highly successful concerns whose sales of these devices aggregated no less than $50,000,000.00 during 1920.

Electrical application and control would be impossible without these devices. Their necessity insures their continued demand, as well as the demand for slate panels and bases upon which to mount them.

ELECTRIC ELEVATORS AND CRANES

The extensive and constantly increasing use of the electrically operated elevator and its never-ending improvement, create a large demand for slate.

The numerous electrically operated cranes, both large and small, that are being installed every year, require slate control panels for each installation.

The Cutler-Hammer Manufacturing Co. of Milwaukee, and New York, are the largest manufacturers of electric control apparatus in the world, having twenty-three acres of floor space, and still growing. This concern used about forty carloads of electrical slate in 1920.

OUR ORGANIZATION TO DATE

M. C. Noel: has been president and general manager of the Noel Slate and Manufacturing Co. since its organization in 1914; has entered into a contract with the corporation to remain its active head for ten years from January 1, 1921.

J. E. Muir: has been with our Company since January 1, 1916, and Superintendent of our Pentwater factory since July 1, 1916.

W. G. Rightmire: has been with us since the organization of our Canadian Company in January, 1919, and is now general manager of that property. (The outstanding stock of the Noel Slate and Manufacturing Co. of Canada, Ltd., is $10,000.00, all of which is owned by the Noel Slate and Manufacturing Co. of Illinois.)

R. M. Whitney: a mechanical and industrial engineer with some previous experience in the slate business. Was retained by us in October, 1920, to collect certain statistical information and report on several phases of the slate industry of Vermont, immediately after which we retained his services as manager of our Vermont interests.

Messrs. Muir, Rightmire, and Whitney are men of proven worth to our company and to the slate industry. They have subscribed liberally to our proposed new stock issue, thereby proving their interest and faith in our future.

The slate industry in the United States is 170 years old. The best slates for electrical purposes are the black slate of Maine and the Cedar Mountain clear purple slate of Vermont, both having practically the same physical and electrical characteristics, and both having fine drilling qualities. The Maine slate is difficult and expensive to quarry and is about five hundred miles farther from the center of the electrical market than the Vermont quarries.

The Noel Slate and Manufacturing Co. have secured a ninety-nine-year lease from the Lake Shore Slate Company covering the slate rights on their Cedar Mountain property, about five miles from Fair Haven, Vermont, upon which there is a known deposit of about 15,000,000 feet of slate, which our experts advise us can be successfully worked from four openings, two of which are already made.

The full consideration for the lease mentioned above is a monthly rental of $300.00 beginning March 1, 1921, and is subject to cancellation by us only, on thirty days' notice. The cash price asked by the Lake Shore Slate Company for this property was $90,000.00, whereas our lease gives us all the rights and advantages of ownership.

The legal sufficiency of the lease mentioned above has been passed upon by our Chicago and Vermont attorneys.

The salient points of our proposed preferred stock issue are:

1. It is a direct and the only preferred obligation of a going corporation which has been continuously successful since its incorporation in 1914.

2. We are engaged in a basic, extractive industry upon which the electrical industry is enormously dependent. There is nothing new or experimental about the quarrying or marketing of electrical slate. The demand for the product does not have to be created—it actually exists, and our proposed output of 100,000 feet per month cannot possibly satisfy the full demands of the electrical industry.

3. In the opinion of our experts, and of the General Electric Company's purchasing department, the Cedar Mountain purple slate is the best in the Vermont Slate Belt. There is at present only one other operation on the same vein—that of the Conrad Slate Co.

4. The net profit, after actually padding the estimated disbursements and scaling the estimated income, is conservatively placed at four times the fixed dividend rate on the preferred stock.

5. About 70 per cent of the proceeds from the proposed issue of preferred stock will be immediately invested in tangible property such as quarry equipment, mill machinery, raw materials, and factory site, provided the latter is not obtainable as a free site from the town of Fair Haven for which negotiations are now pending. About $150,000.00 will be needed as working capital.

D. Stock Subscription Form

NOEL SLATE AND MANUFACTURING COMPANY

A Corporation of the State of Illinois

Capital Stock now issued and outstanding—$20,000.00 of one class, having a book value as of December 31, 1920, of approximately $115,000.00.

PREFERRED STOCK AGREEMENT

It is proposed to change the charter of the Noel Slate and Manufacturing Co., an Illinois corporation, to provide for: 5,000 shares 8 per cent cumulative sinking fund preferred stock, par value $100.00 each; and 10,000 shares common stock, no par value.

Said preferred stock to be preferred both as to assets and dividends. Dividends payable either annually on December 31 or semi-annually on July 31 and December 31. Said preferred stock to be callable at par and accrued dividends on any dividend date on sixty days' notice to stockholders at the last address furnished the Company.

The 10,000 shares of said common stock shall be issued to the present owners of the stock of the Company in exchange for their present shares, *the owners thereof agreeing to set aside 5,000 shares of said common stock and to transfer same, pro rata, to the preferred stockholders upon full payment of their subscriptions without further consideration.*

From the net earnings of the Company in each year, after making proper provision for all expenses, reserves, depreciation, depletion, and all dividends on the preferred stock accrued or due, there shall be set aside into a fund for the redemption of the preferred stock, not less than one-half of such net earnings. As often as the redemption fund shows $50,000.00 accumulated therein, 500 shares, as near as may be of the preferred stock shall be retired pro rata on all stockholders, but fractional shares shall not be retired, and the amount apportioned to such fractional shares shall remain in said redemption fund for further accumulation. The remainder of such net earnings may be appropriated as dividends, reserved or applied as determined by the Board of Directors. No dividend in excess of $5.00 per share per annum on the common stock shall be paid until all of the preferred stock is retired.

Said issue of preferred stock shall be a closed issue and no new stock or other securities or obligations shall be issued by the Company having a superior or equal lien on the property of the corporation except with the consent of two-thirds of the said preferred stock issued and outstanding (this provision, however, shall not apply to the creation of ordinary debts in the operation of the business).

The proceeds from the sale of preferred stock shall be used for the purchase of a factory site at Fair Haven, Vermont (unless a suitable site can be leased on favorable terms), the erection of a modern slate mill having from 40,000 to 50,000 square feet of heated floor space, the equipment of same, the equipment of the necessary quarry developments, for working capital and for such other needs of the business as the Board of Directors may determine; said slate mill to be designed and built by Lane and Lane, industrial engineers.

The Board of Directors of the Company shall consist of seven members.

The undersigned hereby subscribes to the number of shares of said proposed preferred stock set opposite his name, to be paid for when and as called for by the Board of Directors at the rate of $100.00 per share. This subscription to be binding only in the event that $500,000.00 par value of said preferred stock be subscribed for and that said stock be authorized by the State of Illinois in accordance with the above provisions prior to May 1, 1921.

Witness the Hand and Seal of the undersigned this.....
day of ....., 1921.

	No. of Shares	Amount
..... (Seal)	.....	$.....

Subscriber's address.....

.....

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