the consideration of this enters the present and potential factor of—

(a) The Market
1. Types of consumers
2. Geographical distribution of consumers
3. Types of distributors
4. Geographical locations of distributors
5. Statistical data of consumption
6. Trends of fundamental economic conditions
7. Competitor activities
8. Sales expense, and many other items

(b) The Plant
1. Equipment
2. Capacity
3. Labor conditions
4. Raw material conditions, and inventories
5. Costs

(c) Financial Resources
1. Funds for additions to plant or equipment
2. Funds for advertising and sales promotion
3. Funds for purchasing programs
4. Funds for personnel programs, and other items.
5. Ratios

The necessity for accurate and comprehensive market information sufficient in scope to determine manufacturing policies and to lay out running schedules makes it necessary to give the types of sources from which such information can be secured.

(*a*) *Statistical Services and Publications.* Certain organizations collect and tabulate information from basic industries which present an excellent measure of business conditions, and form a basis for rather accurate forecasts so far as general conditions are concerned. The indices most commonly used are interest rates, wages, commercial paper, "20 average industrials," iron and steel production, unfilled steel orders, rediscount rates (Federal Reserve Banks), commodity prices, "cost of living," unemployment ratios, building permits, automobile output and registrations, gasoline consumption, crop forecasts, such as grain and cottons. The most prolific sources of statistics are the Department of Commerce, Bureau of the Census, and the Department of Agriculture.

Granting that these statistical measures of business form an accurate basis for prediction, there seems to be a wide gap between these forecasts and their application to the individual business.

(*b*) *Advertising and Research Service.* These organizations offer a method of amplifying general statistics and applying them to an individual business. In market research the main value of such an agency is the rapidity with which the market can be covered; a knowledge of the customers' reactions to goods and to selling methods, and the fact that the name of the firms making the investigations does not appear. The disadvantages are the danger of a superficial investigation due to a lack of accurate knowledge of the goods and of the methods of marketing and the danger of the personal equation of the investigator entering into the work, and of the "advertising slant" biasing the entire report.

One organization has successfully avoided those dangers and operates as follows:

1. Conference in which the scope of the investigations is outlined in detail—even to the questions to be asked.
2. A short period of training for the field men—who are not advertising salesmen.
3. Reports and interviews submitted at very short intervals—in order to insure the proper control of the investigation.
4. A final report in which the questions prepared in the original conference are presented in tabular form with the answers arranged so as to indicate the "market value" of the firm giving the information.

(*c*) *Research by Individual or Cooperating Firms.* This is probably the best way that general market trends, as developed from basic statistics can be applied to an individual business. This type of individual research sometimes known as "sales engineering," embraces product analysis, i.e., a comparison with competitive brands as to quality, cost, put-up, distribution; sales analysis as to volume, territory, etc.; market analysis, new markets, new uses for products. Cooperating firms such as trade associations, etc., in theory cover this same ground at a much lower unit cost. The value of such an association lies in the degree of support of the members, and the amount of information concerning their own business which they are willing to contribute.

In individual research salesmen furnish an excellent point of contact. A list of two or three questions, such as stock on hand, future demand, and new lines or customer development would aid greatly in manufacturing and planning policy work. The salesman is of greatest value as a check on information secured from other sources. Where there is a lack of definite facts concerning any market developments, special research men may be employed. It is imperative that their opinions be checked against information furnished by the salesmen. The use of special research men should be considered only where the cost of their services per pound or other unit is sufficiently low to be no more of a factor than an advertising appropriation, and then only when there is a specific policy covering collection and analysis of market information. From these sources, information should be collected and presented to the responsible executive merely as a series of facts so arranged as to enable him to make the necessary decision. In cases where opinions even from responsible sources are given, they should be given as opinions, and should be accompanied by all available facts, both in support and in opposition.

2. Analysis

Analysis for master planning is the compilation of research data into reports, tabulations and graphs to make the information available and comparable for the next step. Statistics should especially indicate the part in which the individual firm may or may not follow the indicated trend. The value of this method of building up within the organization an analytical study of sources of information lies in the accumulation of fact and of experience within the company sufficient to make safe comparisons and to work out sound development policies.

Analysis most often comes down to a form of statistical operation. Rarely, however, does this suffice for complete analysis. Someone has well said "You can transmit knowledge but not experience." Therefore, research should bring together all possible opinions of experienced men and these should be digested as a part of the job of analysis. The analytical man should have capacity for expression of his conclusions in a report to the management, outlining the standard or goal upon which management is to decide as the basis for a master plan.

3. Synthesis

Having compiled and analyzed the data, the next step is that of synthesis. All the separate elements, as revealed by the research and analysis, are combined into a logical and complete whole. In other words, this is the time when a definite goal is established. The general limits and requirements of production, as well as those of sales and finance, are outlined. They will show which articles must be manufactured, the quantity of each to be produced and the design of the products, the type of labor necessary, and the cost and profit on each item. Limits, tolerances, and degree of quality and finish, as well as kind of raw material, are determined. Standards of performance are set up which are thoroughly investigated and are possible of attainment.

The establishment of a goal is a management policy decision and must precede planning. This means that we must gather all information bearing upon the problem, analyze it, and set up a standard which is to be the goal of a master plan. With this established, the planner then determines what departments will be affected and what parts they are to play in reaching the goal. A master plan is usually ineffective unless, in the process of formulating it, an agreement has been reached with each department head in regard to his part in the schedule of operations. A master plan cannot be superimposed from the top; it must be built up from the bottom.

4. Planning

The planning step is the formulation of the different master operations in a sequence which will make the goal attainable. Some one individual, or a group, who knows the policies of the organization and the system and methods of the plant departments is best suited to plan the sequence of operations. Where to draw the line between master and detailed operations is always a problem. It is a mistake to go into detailed operations where not absolutely essential. A master plan should be a concise condensed document, as its purpose is to give the management a guide to the sequence of operations as a means of coordinating activities. Where it brings in new methods it must clear up any uncertainties, but where existing methods or routines are involved it should be exceedingly brief.

5. Scheduling

Scheduling is the planning of the time factor for each master operation so that the sequence of operations may be performed and the goal attained with the least expenditure of time, effort and resources. Here is where the master plan functions to good advantage. It aids in cutting out wastes and interferences. It enables the departmental planners to grasp the relation of their operations to the general plan and to the plans of other departments. Charts of actual versus scheduled performances enable management to act before emergencies arise.

It has been stated that only the date of completion is of real importance. Yet even this cannot be arbitrarily maintained for the human equation and acts of providence interfere. It must be a standard but in practice you must provide an element of flexibility. That is why the written plan and schedule are so much