PRINCIPLES OF MARKET RESEARCH

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by

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PREFACE

The object in writing this book has been to help bridge the gap in the technical literature available in this country by providing a treatise covering the principles and practice of market research in such a way that it will appeal to both the practising manager and the student of management, who requires a general text-book on the subject. It does not, however, pretend to be a comprehensive work dealing fully and in detail with every aspect of market research; indeed, such a work would require more than one volume.

For the practising manager, to whom the subject of market research may be almost a closed book, it is hoped that the following chapters will provide an easily understood exposition of the scope and applications of this comparatively new tool of management, and that from reading them he will gain a knowledge of its methods and techniques that will enable him to use more effectively the results of research undertaken for him by others, and the better understand and appreciate the problems involved.

As regards the student, the treatment of the subject has been designed to meet the requirements of the syllabus for market research under the scheme for a National Diploma in Management Studies envisaged in the report, *Education for Management*, of the committee set up by the Ministry of Education, and the recommendations of which are being implemented jointly by the British Institute of Management and the Ministry on behalf of the professional management bodies.

The book is also intended to cover the syllabus for market research required by the final examinations of the Incorporated Sales Managers' Association and that of the Institute of Industrial Administration, both of which support the Intermediate Examination in Management Studies under the scheme, and also caters for the examination of the Advertising Association in this subject.

Although for the purposes of these examinations the student is not expected to be conversant with higher mathematics or advanced statistics, he is nevertheless required to have a sound knowledge of the principles involved and an awareness of the practical uses and limitations. Due regard has been given to these considerations in the book.

It is hoped that the student, whose knowledge of these subjects is more advanced, or who wishes to make market research as such his future profession, will find the present volume a useful introduction, though he will undoubtedly require to undertake more advanced reading on particular aspects than this book provides. A bibliography of suitable books has been appended for this purpose.

Finally, it is perhaps appropriate to apologise to the professional statistician for what may be considered a somewhat unorthodox treatment of some of the statistical material in the book. This has been done in the interest of the reader, who, unversed in the deeper mysteries of the science of statistics, requires a simple explanation so that he may grasp the fundamental principles. For this liberty the author will perhaps be forgiven.

The author wishes to record his thanks for their help and advice to Dr. Edward L. Lloyd of A. C. Nielsen Company Limited, W. N. Coglan of Sales Research Services Limited, A. K. Chappell of the Metal Box Company Limited, H. Henry of Market Information Services Limited, and to the A. C. Nielsen Company Limited, the American Marketing Association, Hulton Press Limited, General Motors Corporation Customer Research Staff and to Harvard University Graduate School of Business Administration, for permission to reproduce material, without which this book would have lost much that is of value.

Remenham, Berks.
February 1950.

A. H. R. DELENS.

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THE PURPOSE AND SCOPE OF MARKET RESEARCH

Before considering the practical applications of market research and discussing the techniques and the methods that it uses, it is necessary to give some thought to its place in modern industry and commerce, and briefly to consider what contribution it has to make to the prosperity of individual business concerns and the community as a whole by increasing the efficiency of the marketing function. It is also very necessary to be aware of its scope and its limitations if it is not to be misused.

Its Purpose—Some Economic Considerations

The pattern of modern industry is one of large-scale production depending on ever-widening markets, which are the results of continually improving standards of living throughout the world. Improving standards of living are not, however, automatic. For the standard of living of any community to improve, there are two necessary conditions:

1. The consumers' real incomes must be improved either by increasing their money incomes or by reducing the prices of the goods they purchase.
2. Waste of the community's economic resources must be eliminated, as far as possible, by producing the right kinds of goods and making them available to the consumers at the right time and place, in the right quantities, and at prices acceptable to them.

These two conditions are inter-dependent, because a modern community is largely made up of producer-consumers. In other words, those who are the producers of goods also form

the bulk of the consumers of goods.[1] Now if the market for goods is to be expanded so that manufacturers, by virtue of selling large quantities, are enabled to pay better wages and reduce the cost of their products by using more efficient methods of production, then the incomes of the mass of consumers who make up the market must be improved to enable them to purchase more, and this, of course, depends on whether manufacturers can expand their markets sufficiently to sell more at lower unit cost. Expanded markets for consumer goods would also tend to benefit those engaged in distribution, because of increased turnover, and those engaged in the production of industrial goods, because of increased demand for these goods by consumer industries.

Since, under normal conditions of trade, consumers will not go to much trouble to seek out manufacturers' products so that they may buy them, it is clearly the manufacturers who must take the initiative by getting to know their markets so intimately that not only do they know in what directions their markets can be expanded, but also how they can supply their existing markets with the greatest efficiency and at the lowest cost.

The very nature of large-scale enterprise makes the task of getting to know the market a difficult one, because of the gap which must exist between the producer and the consumer. As long as trade was confined to individual transactions, where the producer sold direct to the consumer, it was a comparatively simple matter for the producer to know his market, because direct contact existed between producer and consumer. Trade under these conditions was largely a matter of the consumer telling the producer what he wanted, the producer suggesting technical improvements, or alterations to bring the product within his manufacturing capacity, and a bargain being struck to the satisfaction of both parties.

The development of factory production and the rapid evolution of new inventions and improved methods and processes made it possible for goods to be manufactured on a much larger scale than had been previously possible. An increasing

[1] Here are included the producers of services, including distribution. In fact anyone who works produces something.

population at home, the changeover from an agricultural to an industrial economy, and the fact that Great Britain was the first in the field, all contributed to give British manufacturers home and export markets of such size that practically anything that could be made could be sold. Under these conditions little effort was required to sell and distribute their products, and it is little wonder that managements concentrated their efforts on more and better production, leaving the rest very much to look after itself.

These conditions could not last. Increased efficiency in production in this country and overseas, and the development of industries in foreign countries, resulted in the needs of consumers being very largely met, in fact, supply caught up with demand and managements had now to set about improving methods of selling and distribution. Manufacturers began to spend more effort in creating wider markets by advertising and by the use of intensive selling methods. Soon the customer became all-important and competition for his favour became very intense.

Large-scale production backed by intensive selling makes it possible for large quantities of cheap goods to be put on the market. This, however, does not necessarily mean efficiency in business and often leads to a wastage of economic resources. Many concerns have gone out of business simply because they produced quantities of goods that consumers did not want. Many dealers' shelves have been stacked with goods consumers would not buy. Manufacturers have lost money through producing lines that could not pay for themselves or because they maintained unprofitable accounts.

All this means waste, a waste of economic resources, because labour, money and materials are put into the manufacture of useless products, or are squandered on useless effort, and are no longer available for profitable uses. Economic resources wasted means a contraction of purchasing power and hence a contraction of the market, which results in loss to manufacturers and distributors, loss to wage earners through unemployment or wage cuts, and a further contraction of purchasing power. To eliminate this waste it is necessary in the first place to

establish a closer contact between manufacturers and consumers. This means that production and distribution must be backed by a sound and accurate knowledge of markets and that the free choice of consumers must be led into channels which will ensure economic production.

It is pertinent here to consider how far consumers can be left free to choose their requirements. The first obvious fact is that although the majority of consumers will have broadly similar tastes and requirements, there will be an infinite variety of desires emanating from a minority, whose tastes do not conform to those of the majority. No manufacturer, whose business depends on large-scale production, can cater for an infinite variety of individual tastes and must confine his production to a limited number of products, which will have a majority acceptance. If the consumer is to be allowed a freedom of choice in what he buys, then logically the manufacturer must be allowed a freedom of choice in what he offers.

If a manufacturer's turnover is to remain on a satisfactory scale, however, it is necessary for a compromise to be arrived at between the needs of the majority of consumers and the producing capacity of the manufacturer—a compromise which will be acceptable to both. This presupposes a degree of understanding between the manufacturer and the consumer, and towards this understanding the following conditions are necessary:

1. Producers and distributors should make a continuous study of consumers' needs and desires.
2. Production should be rationalised so as to meet the needs of consumers as efficiently and as economically as possible.
3. The consumers' choice should be led into channels which will ensure economical and efficient production.
4. Distribution should be effected in such a way as to ensure a maximum of efficiency and a minimum of waste.

In the years between the wars these facts were becoming increasingly recognised and the need to bridge effectively the

gap between producer and consumer led to the development of scientific market research.

Market research is not, however, in itself an innovation. It is almost true to say that it has been practised, though unconsciously and in a primitive form, ever since men first began to buy and sell. What is new about market research is that it has now been developed on methodical and scientific lines. The value of market research depends on the scientific collection, analysis and interpretation of facts. Inaccuracy in any one of these operations can but lead to misleading conclusions and false judgment, which means waste and loss to producers, distributors and consumers.

THE SCOPE OF MARKET RESEARCH

Market research is really a matter of plain common sense. It is to the manufacturer what military intelligence is to the general, and as such can be described as the intelligence tool of management. It is concerned with all aspects of marketing; that is, all problems relating to products, markets and methods of sale and distribution.

Market research can be defined as "the systematic and continuing study and evaluation of all factors bearing on any business operation which involves the transfer of goods from a producer to a consumer". Thus market research begins logically before production, in fact before the factory is built or the plant set up, and continues as long as a business continues to operate.

Stress should be laid on the word "continuing", because market research is essentially a continuous process, and if the best value is to be obtained from its use this fact must be recognised. Although *ad hoc* pieces of research are often used to solve particular problems which may be non-recurring, these single and apparently independent pieces of research are really high lights in a continuous process and make use of data accumulated as a result of this process if they are to be of real value.

By its definition the scope of market research is wide and

covers all aspects of marketing. Since marketing begins with a consideration of what products are to be made and those products are made as a result of a definite policy, it follows that market research is concerned with all marketing factors which may affect those products and their sale, and also with all matters of policy which have a bearing on the market for the products. What, then, is its scope?

1. It is concerned with products, whether goods or services, because it studies market reactions to those products, and by collaborating with technical product research can determine the best compromise to meet the requirements of manufacturer and consumer. Market research is of value in determining what quantities should be produced to meet demand and in helping to decide such policy matters as design, colour, size, etc., not only of the product itself but also, in the case of consumer goods, of the pack. It does not, or should not, interfere with the process of production, but serves to guide production into the manufacture of goods that will be accepted by the market.

2. It is concerned with markets, because it studies the consumers who make up markets. It evaluates the importance of the different classes of consumers in the marketing of particular products. It analyses their actions and determines the reasons for them. It determines their respective demand for, and acceptance of the product, and the effect of various forms of publicity used to promote the sale of the product. It also assesses the strength and weakness of competing products, the reasons for them and the effect of competitive publicity, and compares these factors with similar factors relating to the product being investigated.

3. It is concerned with sales and distribution, because having determined the market it can indicate who and where the consumers are, what is their number and how best to reach them. It will discover their habits and show where they purchase their goods and why. It will discover what types of outlets are most profitable and those that are less profitable. It will indicate, by assessing their appeal to consumers and dealers, what forms of publicity are best calculated to promote the sale of the product to dealers and consumers.

Thus, broadly, the scope of market research can be said to cover business problems relating to any of the following:

1. Marketing policies and methods.
2. Markets in terms of consumers.
3. Channels and methods of distribution.
4. Products, whether goods or services.
5. Product use development.
6. Publicity—advertising and sales promotion.
7. Selling activities and performances.
8. Competitive products, methods and publicity.

While the above classification is a bare outline of the scope of market research, it will serve its purpose by giving an idea of the vast field covered by market research. Its applications are discussed more fully and in greater detail in the remainder of this book.

SOME LIMITATIONS

Although market research is invaluable in the solution of many business problems, it cannot provide the answer to every business problem and it would be misleading to pretend that it can. It does not aim at eliminating the need for sound business judgment based on experience. What it does is to eliminate the need for guessing where facts can be obtained. It provides the business man with accurate information which will serve to focus his judgment in such a way that the possibility of error is reduced to the minimum and the best results are achieved.

Nor must it be claimed that market research is an exact science, it is not; and it would be wrong to claim for it a greater accuracy than it is capable of producing, quite apart from the fact that by so doing it would gradually fall into disrepute. What can be claimed, however, is that the techniques of market research are based on scientific methods of collecting, analysing and interpreting facts, and it is for this reason that it has a valuable contribution to make to business management.

As market research develops and its techniques are improved, so will its limitations become more apparent. This is, of course, all to the good, because knowing its limitations and appreciating

what it can and cannot do will lead to greater accuracy and avoid errors of judgment. For the purposes of this book, the limitations of market research can be divided into three broad categories:

1. Limitation of Accuracy. The full significance of this limitation will be fully covered in later chapters. It is important, however, to appreciate at the start that market research is concerned with the study of human behaviour and that in assessing human behaviour it is quite impossible to achieve absolute mathematical accuracy. The most that can be said is that the findings are accurate to within pre-determined limits. This does not mean that their value is lost. In business absolute accuracy is seldom necessary; what is important is that reliable data should be forthcoming on which plans can be formulated with the assurance that they will not be wrong. In any case, it is better to be 50 per cent certain than to rely on a guess which may be 100 per cent wrong.

2. Limitation of Time. Since market research involves the collection of facts, the building up and analysis of data, the checking of these data and their interpretation, it is obvious that a study will often take a considerable time for completion. This fact will be better appreciated when it is realised that market research has its parallel in laboratory research, which also often requires a considerable amount of time before it can be completed and the final results are ready. It will occasionally happen in both cases that by the time the results are ready to be put into operation circumstances have so changed as to make them valueless. In market research, which studies people's tastes, preferences, habits and intentions, there is no guarantee that these will not change in time. Usually it takes a considerable time for these to change; and even if some unforeseen factor suddenly emerges to effect a change, this factor will often be known at the time and its effect can be estimated. It is, however, important that any market study should be completed in the shortest possible time, and if this means some sacrifice of accuracy it may be considered, in the light of particular circumstances, that time is the more important factor.

3. Limitation of Personnel. Quite obviously the value of any study will be in direct relation to the quality of the persons that carried it out. Poorly trained or ill-equipped persons can be extremely dangerous and may produce unsatisfactory and even costly results. It is essential, particularly in this type of work, that those engaged in it should be well trained and that their work should be directed by experts. Interviewing is a tricky job, especially since people may give misleading reasons for their actions through their inability to analyse their own thoughts. People may think up what they consider to be suitable answers or may be guided into giving false answers through the very human weakness of pride. Unless interviewers are aware of these failings and are trained to recognise them, they will not check the replies given, with the result that they will be reported without qualification. Interviewers, themselves, have human failings, and, unless they are properly trained, may well succumb to them. The most obvious example of this is the use of a leading question to obtain the answer the interviewer thinks is appropriate. Again, the interpretation of statistical data is no easy field. Effects may not be related to their true causes; in other words, the interpreter may jump to conclusions.

Chapter II

THE APPLICATIONS OF MARKET RESEARCH

It has already been said, in defining market research, that it studies all factors bearing on any business operation involving the transfer of goods from manufacturer to consumer, and perhaps the best way of illustrating how market research can be applied to the solution of business problems is to consider the types of problems that are met with. These problems are numerous and varied: they vary not only with the particular circumstances surrounding a situation but also with the product itself.

For simplicity, the omnibus term "product" is used to cover both goods and services. Again, goods may be of varying kinds, thus there are consumer's goods, manufacturer's goods and capital goods. Whatever the nature of the goods or services, however, there must be customers for them, and where there are customers there are problems. It is these problems that make up the particular sphere of market research. There is no fundamental difference between research for services and research for goods of various kinds. The principles of research are the same and the techniques used are broadly similar: it is simply a question of applying the general principles and adapting the techniques to the individual characteristics of the product or service concerned.

PROBLEMS RELATING TO THE MARKET

Every product has its market and no two products have identical markets, because markets are made up of individuals all of whom have their own particular tastes. If a manufacturer is to serve his own particular market efficiently, he

will find it necessary to define his market; in other words, to find out just who is likely to buy his product and just who does buy it. It is not unusual for a manufacturer's product to find its way into a certain type of home while all the time the manufacturer thinks his product is being bought by a different class of consumer altogether, and consequently his efforts are directed to the wrong market.

POTENTIAL MARKET. The potential market for a product is the aggregate of all those consumers who would be able and willing to buy the product if it were offered to them. Obviously the potential market can never be greater than the population that constitutes it: again, certain elements of the population will be eliminated by certain factors. For example, if the product were a cosmetic, the male population would be automatically eliminated; if the product were a motor car, only certain income groups would be expected to be potential consumers.

In determining his potential market a manufacturer will be mainly concerned with knowing the size of the market so that he can determine the potential demand for his product. This particular problem is one which especially confronts the manufacturer of a new product or the manufacturer seeking a new market. On its solution will depend whether or not it is considered worth while to enter the market and also the quantities it is decided to produce.

ACTUAL MARKET. Here it is a question of establishing what share of the market for a specific type of commodity is enjoyed by a particular manufacturer. This is particularly important to manufacturers of branded goods which are purchased regularly. The Nielsen index, for example, is a technique developed to show changes that occur in a manufacturer's share of the market. It will not always indicate the reasons for these changes, but what is important is that a manufacturer should know when a change occurs so that he can take steps to seek out the reasons and put right defects in his marketing or follow up developing opportunities.

MARKET DESCRIPTION. Surveys can be designed to give a manufacturer a precise description of his market. This is most

important from the point of view of directing sales and advertising efforts so that they achieve the best possible results. For example, knowing the exact geographical distribution of potential users of a product may be very important in deciding upon the method of selling in various localities. Again, to know what income groups, social or occupational groups are potential consumers of a product may be very material in selecting advertising appeals or in directing selling and sales promotional effort.

Although in the majority of cases a market survey will tell a manufacturer many interesting facts about his market, which will be directly useful in shaping his marketing policy and directing his efforts, it is not necessarily essential to resort to surveys in all cases. The following example will illustrate how, by giving the matter a little careful thought, good results can be achieved.

An engineer set up a boring and grinding plant in locality "A" because, firstly, he lived in that locality and this made it convenient for him, and, secondly, since there was no similar plant in the locality he was more or less assured of getting all local business. He did very well for a number of years and eventually the time came when he wanted to expand. He already had all the local business, so that there was no possibility of an increase here. A few miles away there existed locality "B", where there was a lot of business which was already adequately catered for locally. Expansion in this direction was, therefore, out of the question. In locality "C", however, there was an unsatisfied demand, but since locality "C" was some twenty miles away, potential consumers would be unlikely to travel such a distance or to send him their cylinder blocks. The answer was, therefore, to establish a second plant in locality "C". This was done with very satisfactory results.

PROBLEMS RELATING TO THE PRODUCT

These are concerned with the consumers' reactions to the product. Problems concerning the product may be of two kinds:

they may concern a product which is not already on the market but which it is intended to produce, or they may concern a product which is already being marketed. In the former case it would be a question of assessing the need for the new product and the probable consumer acceptance of it in its present form. Research of this nature may lead to alterations in design, colour or other features to make it more acceptable, and would make comparisions between the proposed product and similar competitive products. Where a product is already on the market it will usually be a case of determining the acceptance of the product in its present form and the share of the market it enjoys, and possibly what modifications would be likely to ensure greater acceptance.

It is important to note that market research is complementary to technical research in the laboratory or design shop. The latter is concerned with problems of production and with ensuring a technically sound product, whereas market research is concerned with problems of marketing and with ensuring that the product will be acceptable to consumers. Although a product may be a perfect example of engineering or technical skill, it would be useless as a product if there were no market for it. It is, therefore, essential to determine its probable acceptance by the market before it is put into production and to make such alterations as will ensure its maximum acceptance, always bearing in mind the requirements of technical soundness.

Product Design. It is important to assess the reactions of consumers to the product and the effect of changes in design. While a feature may be sound from an engineering point of view, it may be too advanced to meet with consumer acceptance, and may have to be introduced in a modified form until consumers have been educated to accept it.

Users' Likes and Dislikes. A product may have certain features which make a strong appeal to consumers, but on the other hand certain features may be actively disliked. Research in this direction may point to changes which will ensure greater acceptance by consumers. Comparisons with similar likes and dislikes for competing products may reveal the reasons behind a strong or weak competitive position.

NEW TYPES OF RELATED PRODUCTS. The sale of a particular product may create a demand for a new type of related product, the introduction of which will increase the demand for the original product and ensure its lead in the field. For example, in the field of electrical household appliances, which create a demand for accessories, although the vacuum cleaner was useful in itself, how much more useful did it not become when cleaning tools for upholstery, inaccessible places, corners, etc., were introduced.

PACKAGE DESIGN. Alterations in packaging can have a very marked bearing on the acceptance of a product. For example, a container which is not easy to open and which may cause the contents to spill, or which may cause injury to the housewife, would be a serious handicap to an otherwise excellent product.

PRODUCT TESTING. The testing of a product on a selected cross-section of its potential consumers, before launching it on the market, is probably one of the most important applications of market research. It ensures that a new product is finally marketed in the form in which it is most likely to meet with the greatest amount of success.

The object of discovering the market's reactions to a product is simply to find out whether it does fill an existing need, and if so, how it can best be adapted to ensure maximum acceptance by the market. When a new product is being designed and perfected, it often happens that those who are engaged in this work, while concentrating their attention on pure technical or engineering problems, lose sight of the needs of the consumer and the features which will ensure acceptance. Market research can rectify this tendency by keeping a sensible balance between the requirements of technical performance and the needs of those who will eventually use the product.

PROBLEMS RELATING TO PRODUCTION

Apart from purely technical production problems, there are many problems of production which are directly affected by the market for the product. There is, however, in modern

industry a considerable gap between the factory and the ultimate consumer, and changes in consumer demand may not be felt in the factory for a considerable time. If a smooth production run is to be maintained it is essential that changes in consumer demand should be known as soon as they begin to occur so that they can be catered for in the factory.

Rationalisation of Product Lines. A manufacturer may produce any number of sizes and colours, or varieties of other features in a product line. While some of these may be in constant and steady demand, the demand for others may be so small or spasmodic that he actually makes a loss on them. In such cases it would be for market research to discover which lines were profitable and which could usefully be discontinued. A product which may be unprofitable in itself may, however, have an important bearing on the sales of another profitable product. Such factors are important, and should be ascertained before decisions to rationalise are taken.

Economical Runs. Keeping down costs is always a problem which exercises the mind of a production manager, and in order to do so he will try to keep his runs as long as possible. If this is done as a matter of course without any study of the market, there is a danger of producing too many goods of a particular kind. If the demands of the market are determined beforehand and a continuous check is kept on changes in demand, production runs can largely be determined in advance, so that they will be as economical as possible without the risk of accumulating unwanted stocks.

Thus it can be seen that the wise use of market research can serve to guide production so that the capacity of the factory is utilised to its best advantage.

PROBLEMS RELATING TO SALES

Since the sales department is mostly concerned with the market for the product, and it is market research that studies the market, there will naturally be a much closer link between the sales department and market research. It may even be in

certain companies that all marketing information passes through the sales department before it is broken down into elements useful to other departments. Market research will not only help the sales department in evolving its policy and making its plans, but will also be useful in enabling it to keep a constant check on performance.

CHANNELS OF DISTRIBUTION. By discovering the buying habits of consumers market research can establish what channels of distribution will be most useful for a particular product, and will evaluate the performance of different types of outlets. Quite often a product does not find consumers in a particular section of the community simply because it is not being sold through the type of outlet where that section normally buys. Knowledge of this fact will enable the sales department to take the necessary action to remedy the situation.

SEASONAL TRENDS. Factory sales are seldom synonymous with retail sales. The gap between the two varies, of course, with the product, the market and other factors, but the essential thing to remember is that changes in sales to consumers will not be felt in the factory for some time. To know at what times consumers tend to buy more or less of a product is important to sales planning, because it enables the sales department to prepare for these fluctuations and adjust its sales and advertising efforts in a way best calculated to get the most out of them.

NON-SEASONAL CHANGES. Changes may occur that are not in line with normal seasonal fluctuations. These changes may be due to economic conditions or to competitors gaining or losing ground. To be aware of these changes enables a manufacturer to further use market research to find out the reasons behind them and meet the developing situation *before* its effect is felt in the factory and possibly avoid considerable strain on his resources.

WEAK SPOTS. Decreasing sales may be due to some weakness in marketing policy or marketing methods: it may be a question of price, display, distribution, advertising, etc. By surveying consumers and dealers such weaknesses can be detected, and the results of changes in policy or methods can be assessed,

thus keeping a continuous check on the performance of the product.

QUOTAS. By assessing the potential and actual demand for a product and the changes which occur in demand, market research will enable the sales department to set and alter salesmen's quotas in accordance with the potentialities of their territories.

SERVICING REQUIREMENTS. This will only apply to products requiring after-sales servicing. Unless servicing facilities are established according to the needs of the consumers and in the best way to meet these needs, not only can goodwill be endangered, but, on the other hand, money can be lost in attempting to meet a need which may be non-existent.

A sales department which uses market research can keep a finger continuously on the pulse of the market and adapt its actions to meet changes before they occur.

PROBLEMS RELATING TO ADVERTISING

The use to which market research can be put by a manufacturer as regards advertising will naturally depend on the extent to which he advertises and the purpose for which his advertising is designed. Whether he has his own advertising departments or depends entirely on the services of an agent, however, advertising is for his benefit, and market research can be used to advantage to direct his advertising so that it achieves the best results.

MEDIA SELECTION. The first thing a manufacturer or his advertising agent will want to know is where to place the advertisements. Obviously it would be of little use advertising foundry equipment in journals which are only read by housewives, and, similarly, it would be equally valueless to advertise a new custard powder in a technical review. Every case is not, however, so obvious and it is important to know beforehand how useful each medium is likely to be for particular advertisements. The first thing an advertiser will want to know is the readership of various media. The class of person reading each

medium, their profession or occupation. The comparative pulling power of various media among various sections of the population, by income groups, age, sex, occupation, locality, etc. Surveys have been done to show these factors and it is well worth while consulting the results of such surveys before deciding the media. The most notable example in recent years is the Hulton Readership Survey.

COPY-TESTING. It is difficult to measure the effectiveness of particular advertisements by using records and statistics alone, and probably in many cases impossible. By survey methods, however, it is comparatively simple to test the effectiveness of particular advertisements by measuring the reactions of consumers to them, the extent to which they are noticed and remembered and their influence on purchases.

DEVELOPMENT OF COPY. Research for this purpose is begun before the copy appears and resembles that which is carried out in product-testing, except that instead of a product an advertisement is tested. By this method it is possible to determine beforehand what audience is to be approached, what appeal will give the best results, the type of layout and illustrations.

THE VALUE OF ADVERTISING RESEARCH

There exists today some controversy on the value of research in advertising. Perhaps, most of the arguments against research come from media owners who fear the revelation of the true value of their media, certainly some opposition comes from the creative advertising man who fears an increasing measure of interference by the research man. If all creative men were first class, research would be unnecessary, but with the increase in advertising, how many advertisements will in fact be produced by first-class men? Research can help to guide the creative man, if only by confirming what he already knows.

On the other hand, with the mass of different media that exists today, the advertiser is entitled to know the value of what he is buying and to safeguard himself against wasting his money on unproductive advertising. In the same way that the advertiser requires information about his market, so does he

require faithful information about the media he proposes to use, and about his proposed appeal, before he uses it. What class, age or sex read the available media? Who notice and remember his advertising? Whether his advertisements do in fact bring him additional business or are essential to maintain his present volume?

It is, however, a fact that in copy-testing there exists a confusion factor. Respondents do in fact claim to have seen advertisements that have never appeared or to confuse one advertisement with another that has a strong "family" likeness. The extent of the confusion likely to occur can, however, be established by a pre-test. During the survey itself a control device can be used to separate the unreliable informants from the rest of the sample, by including advertisements, which have never appeared and some of which have a family likeness to genuine advertisements, among the sample advertisements shown to respondents.

PROBLEMS OF EFFICIENCY

Profit is usually directly related to the efficiency of a concern in producing and marketing its products, but perhaps the greatest losses can occur in marketing, because it is more difficult to measure marketing efficiency. Large sums are often expended in advertising without any knowledge of the exact contribution that particular advertising makes to the volume of sales. Again, unprofitable accounts or product lines can be maintained for years and the fact never realised until a little elementary analysis of business records is undertaken.

THE ANALYSIS OF SALES. Before any analysis of sales can take place, records must be kept in such a way as to enable an analysis to be made. The analysis of sales-records will serve to show the profitability of the various lines that are marketed and the profitability of the various forms of outlets. Broken down still further, it will show up profitable and unprofitable customers, those whose purchases are increasing and those whose purchases are decreasing. It will also show up trends

and changes in demand, in total and for different areas. A business may well show increasing total sales at the same time that sales in a particular area are decreasing. Once this fact becomes known by sales analysis, further research is indicated to discover the reason, which, once known, enables steps to be taken to stop the decline.

THE USE OF RATIOS. A number of ratios can be used to show the relationship of one factor to another, and it is usually an excellent way of keeping a check on the efficiency of marketing operations. For example, ratios of the cost of salesmen's salaries, commissions and expenses to sales can be established, and divergence from these ratios will at once be noticed. Generally such ratios are valuable for the purpose of measuring the relationship between costs and income and profit. Their uses will be described in a later chapter.

PROBLEMS OF PLANNING

The forecast of future sales is the foundation on which the business forecast and budget of a concern depending on the distribution of its products must be based. The budget for every other department will depend on the sales forecast, because sales normally represent the largest portion of the income of a concern. Thus the sales forecast is used as the basis for:

(*a*) Measuring the concern's operations during the period under review.
(*b*) For compiling other budgets, notably the budget of capital expenditure.

It will usually be based on some average of past sales and on predicted future market conditions.

It is precisely in predicting future market conditions that there is the greatest possibility of error and, therefore, the greatest need for care and the use of all possible information which will lead to an accurate forecast. This information will consist of two elements:

1. A forecast of the future economic climate.
2. A knowledge of all the factors which will influence sales of the product and how these factors will act in combination and in relation to general economic conditions.

The economic climate can be ascertained by a careful analysis of general economic conditions and by studying reliable economic reports. The factors which influence sales of a particular product can be ascertained by careful analysis of past records and by research. It is, however, very important not to overlook the effect of new developments, new developments which may be related to people's reactions. It is because people are dynamic and their actions are unpredictable that this particular factor is so important.

USE DEVELOPMENT OF PRODUCTS

If the marketing of a product is to be successful, that product must give value in use. By studying the ways in which a product is actually being used, particularly in industrial products, it is often found that it is not entirely satisfactory in the use to which it is being put, very often because it is being used for a slightly different purpose from that for which it was originally intended, there being no product available to fill the exact need. The discovery of such facts opens up new fields for the enterprising manufacturer; by keeping abreast of the needs of his customers, a manufacturer can continue to develop his products in line with those needs or he can develop new products to meet new needs.

Similarly market research often discovers uses to which a product is being put and of which the manufacturer may not have been aware.

Chapter III

PLANNING THE PROCEDURE

Market research involves the use of scientific methods of thought, collection of data, analysis and deduction. Method is simply the arrangement of processes in a logical sequence, and before any operation is begun it is logical to think about it and plan the procedure by which it is hoped to arrive at useful conclusions.

Unless research is planned, there is always the danger of going off at a tangent and losing sight of the objective. Although this may be permissible or even desirable in certain kinds of research where exploring every avenue is more important than cost and speed, it is certainly not the case in business, where problems are specific and must be solved satisfactorily in the shortest possible time and at the lowest possible cost.

If a company intends to market a new product it is no use deciding to run a survey of consumers and going straight into building up a sample. Similarly, if a company's profits are declining or if it is losing ground in a certain market it is no use deciding on a survey immediately, because when all the facts are known A SURVEY MAY NOT BE NECESSARY.

It will, therefore, always pay handsomely to think carefully before any research operation and to plan the procedure in detail. But in order to do so satisfactorily all available facts must be known to the man who is to undertake the work, and if an outside expert is being employed the company must make these facts available to him even to the extent of disclosing confidential information.

DEFINE THE PROBLEM

The first step is to define the problem, to know exactly what is to be solved. This step is the foundation stone of any research

operation, because, unless the problem is known exactly, research is almost bound to be misdirected with a resultant wastage of money and effort and a consequent sense of frustration due to unsuccessful operations, to say nothing of the danger of misleading results.

Defining the problem is not always easy, and usually requires a considerable amount of thought. It will usually be found helpful to write it down, and having written it down to eliminate all superfluous expressions and words so that eventually the problem stands out in its exact terms. It is this stage of the procedure which requires a considerable amount of experience and knowledge not only of marketing and business in general but also of the particular business being investigated.

At this stage it is essential to consult as many people as possible so that as many brains as possible are brought to bear on the problem. It is a stage of planning the procedure where the executives actually engaged in running the business can be of the greatest help, because they know the ins and outs of their business and will be aware of factors of which the outside expert will have no knowledge. On the other hand, it is these executives who, being closest to the problem, are most likely to have preconceived ideas and to jump to conclusions.

The following examples illustrate what is meant by defining the problem.

1. A manufacturer of products used by other manufacturers in their own products found that practically all his revenue from sales was being absorbed by costs, with the result that profits were negligible. His business had been built up over a number of years and he had established an excellent though small connection.

   As he did not advertise, he assumed that to increase profits he would have to sell more, and in order to do so he would have to advertise. To this manufacturer the problem appeared to be: "How to advertise most effectively in order to increase sales."

   The advertising agent he selected was faced with advertising a range of some six hundred different products.

This task was so formidable that he decided to do some research and managed to persuade the manufacturer that this was necessary. The problem was not, however, how to advertise most effectively, but in far more general terms: "How can the business be made to show more profit?"

Defining the problem thus led to a thorough investigation of the business's records, from which it was clear that reducing the range of products to forty would result in a loss of only 10 per cent in sales, but all sales would show a profit. As soon as this policy was put into operation, profits began to rise and then came the time to begin advertising.

2. A second example concerned a manufacturer of vacuum cleaners who in spite of increased expenditure on advertising and sales promotion, an improved machine and a reduction in price, could not increase his sales to any great extent. On the face of it there was nothing wrong with his marketing and he concluded that for some reason or other the cleaner itself was at fault and did not appeal to consumers.

He decided to run a consumer survey to discover how he could adapt the cleaner to suit consumer tastes and for this job he commissioned a market research agency. The agency was given permission to investigate his sales records, from which it emerged that while 90 per cent of the dealers were selling very small quantities only, the remaining 10 per cent accounted for the bulk of the sales and were spread throughout the country, two or three being in each salesman's territory.

The problem, then, was not "How to adapt the cleaner to meet the consumer's needs" but "Why did the bulk of dealers not sell the same quantities as the few?"

On investigation it was found that those dealers whose sales were low also stocked another brand and, while the profit margin on both cleaners was identical, the margin on accessories was considerably higher for the second machine, and consequently dealers were pushing sales of this machine in preference to the other.

It will be said that all this is obvious, but it is the obvious that is usually overlooked. Since defining the problem is such an important step, it is well worth a considerable amount of thought and discussion before any research work is put into operation.

OBJECTIVES

Ultimate Objectives.

Defining the problem will lead automatically to a clear understanding of the ultimate objective of the investigation. Thus in example 1, since the problem was: "How can the business be made to show more profit?" the ultimate objective could have been described as: "To discover the reasons why the profits of the business are so low, with the object of taking the necessary action to put the situation right."

In example 2 the problem was to discover why there was such a difference in the sales of various dealers, so the ultimate objective could be stated as: "To discover why 10 per cent of dealers sell large numbers of cleaners while 90 per cent sell only small numbers so that action can be taken to increase the sales of the 90 per cent to the level of the sales of the 10 per cent."

A man who knows where he wants to go will usually get there by the shortest possible route, but a man who is not quite certain where he wants to go will wander about and possibly never get anywhere. The same principle applies to research. A clearly defined objective marks a goal and the investigation is held steadily to its course. A badly defined objective or the complete lack of one will mean that the investigation will wander down many useless, though possibly interesting, by-ways and may never reach a satisfactory conclusion.

At least one man, the man who is in control of the investigation, should know exactly what he wants so that he can direct the work of his subordinates and discard any work, which is not pertinent to the study, before it begins.

Immediate Objectives.

The road to the ultimate objective will be marked by certain well-defined stages; these can be called the immediate or day-

to-day objectives. Thus in example 1 immediate objectives were defined as follows:

1. What is the cost of each product?

   Products had not, of course, been costed individually, so it was decided to take a representative selection of products and work out their production and distribution costs as nearly as possible. This revealed two interesting facts. Firstly, that some products made a good profit in themselves while others made a considerable loss. Secondly, there was a much larger number of losers than winners.
2. The next step was to analyse all products according to their volume of sales and classify them accordingly.
3. From this the obvious next step was to define at what volume of sales a product became profitable.

   Once this had been done, it was discovered that while forty products did in fact show a profit, the remainder showed a loss.
4. What could be the loss of business if the non-profit-making products were discarded?

   This loss of business was evaluated at 10 per cent and represented small orders of one or two items each at irregular intervals.
5. Does the sale of any profitable product depend on the sale of one or more of these non-profit-making products?

   Again it was discovered that there was no connection between the sales of these products and that from that point of view the unprofitable items could be discontinued.
6. Finally, as an additional safeguard, it was decided to ask customers what their reaction would be to the discontinuance of some five hundred and sixty lines.

   It was found that while there were some objections, they came from customers who represented only some 10 per cent of the turnover whereas the bulk of the turnover came from customers who were simply not interested in the products concerned.

It is not always that such a clear indication of the lines of enquiry to follow is obvious from the start and it may be

necessary to have two or more possible lines of enquiry as immediate objectives to start with. As the investigation proceeds, however, those lines of enquiry that are not likely to yield useful results and to lead to the ultimate objective will become apparent and can be discarded.

SCOPE OF THE INVESTIGATION

The scope of an investigation is intimately tied up with the definition of the problem, and the act of establishing the objective will often determine the limits of enquiry.

Consider, for example, an enquiry to determine why the sales of an expensive brand of marmalade are declining in an industrial area. Firstly, of course, a quick check of other areas should be made to discover any similar trend. If such a trend exists in another area then comparisons of factors obtaining in both areas can be made to discover closely similar circumstances.

If, however, no such trend is evident anywhere else, the enquiry is confined to that area. This very fact limits the possible causes to some factor which is peculiar to that area, and since it is a change that is being investigated it is probably a new factor, and therefore unconnected with the company's product or policy. The scope of the enquiry is already considerably limited.

The possible lines of investigation might be to investigate the economic circumstances of the area; there may have occurred a local depression, followed by unemployment. On the other hand, a new competitor may have begun marketing in a small way, confining his activities to that particular area, or there may have been a falling off in the efficiency of the local sales staff. Circumstances may, on the other hand, point to other possible factors.

If, however, the fall in sales were nation-wide, the scope of the enquiry would be increased considerably and might embrace factors to be found in anything from the company's policy to competitive activity. There will, however, be found pointers which will indicate possible lines of investigation,

particularly if the fall in sales can be related to some factor internal or external.

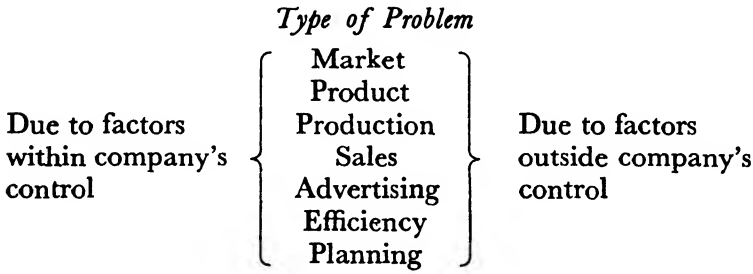
It is in research involving the use of dealer or consumer surveys, that it is most important to define the scope of the enquiry and set its limits. The cost of a survey will be in direct proportion to the length of the questionnaire. If a survey for the purpose of discovering the most acceptable size of a tube of toothpaste also enters into questions of potential market, actual market, degree of acceptance of other brands, readership of advertising, etc., it will be readily appreciated that the survey will cost more.

WHAT FACTS ARE REQUIRED

The marketing problems encountered by any concern will fall into one or more of the broad categories outlined in the previous chapter. There is, however, another classification of the factors underlying marketing problems which it is important to note. These factors may be:

1. Within the control of the concern.
2. Outside the control of the concern.

The following diagram will help to clarify this conception. Any of these problems may be affected by factors that lie within the control of the concern, or outside its control.



In a great many cases the problem will be due to a combination of factors within a concern's control and factors outside its control. This would be the case where a product was not acceptable to the market. Obviously it is within the control

of the concern to change the product, but changing the tastes of the market would be outside its control though it could exert an influence on these tastes greater or smaller according to the weight of its advertising.

The factors which come within the control of a concern will relate to something it does and may be concerned with its policy, the products it manufactures or the methods by which it markets them. The factors which are not within the control of the concern may be related to the market, economic conditions or competition.

The facts that are required in a market study will inevitably depend on the nature of the problem, thus a problem of advertising concerned with discovering an acceptable appeal would not require a quantitative analysis of the market. It is obviously necessary to know what facts are required so that effort is not spent on the collection of facts which have no bearing on the problem.

SOURCES OF INFORMATION

Having defined the problem, decided the objectives, the scope of the investigation and what facts are required, it is now necessary to determine where those facts are to be found. There are normally three kinds of sources of information:

1. The internal records of the concern.
2. External published data.
3. Original external research.

The use of these sources of information and the various methods used to obtain, analyse and interpret the information, form the subject of the following chapters.

Chapter IV

INTERNAL BUSINESS RECORDS AND THEIR USES

If the steps outlined in the previous chapter are followed it will usually be clear what are the likely sources of information in a particular study. It is not often, however, that the records of the business concerned can be disregarded. Indeed, this is usually the most profitable single source of information existing. Whether the analysis of these records is easy or difficult is another matter, depending on the amount of thought that has been put into their planning and the amount of care with which they have been kept.

It not infrequently happens that a business executive, faced with a marketing problem, sends for a market research expert and instructs him to run a consumer survey to discover such and such facts. Quite apart from the fact that this is entirely the wrong approach to a problem, it is as likely as not that the answer to the problem is to be found in the records of the business itself without the need for a survey.

No self-respecting research man, however, would begin a survey without first defining the problem and going through the thinking process already described. He will invariably start his investigations with some form of analysis of the available records, and though he may not expect to find the answer there, these records will almost certainly produce pointers to useful lines of investigation which will become his immediate objectives.

Although it happens that the answer to the whole problem can be found by internal research alone, it seldom happens that it can be found by external research alone. The reason for this is quite simple. It is in the internal functioning of a business that the leads are mostly concentrated and it is there that most

of the clues are to be found. But these clues may not be obvious, and how much research is required before they emerge depends largely on how the records are kept; if they are kept in a form which is suitable for immediate analysis or in such a way that analysis is part of the process of keeping records, then the time and effort required in this phase of research may be almost negligible.

The financial records of a company are usually well kept and comparatively simple to analyse. This is mainly due to legal requirements and to the fact that trained professional accountants are normally responsible for them. The balance sheet and other financial statements will provide material which will, after analysis, disclose the degree of efficiency of various aspects of the business.

Records of sales, however, are not subject to legal requirements and are very often kept by inexpert junior clerks, and unless they are properly designed from the start and under the supervision of a competent person there is the danger that they will degenerate into a mere collection of files.

Sales records are mainly kept in terms of £ *s.* *d.*, it is, however, important that they should also be kept in terms of volume, so that comparisons can readily be made. An increase in price due to increasing costs or to the imposition of a tax may cause a superficial increase in income, while actually concealing a contraction in business. If figures showing the volume of business in terms of number of items sold are also available, then this kind of fact will be immediately apparent.

At this point perhaps a word of warning is needed on the danger of a business becoming too record-minded. It does happen that a too enthusiastic form-filler will find himself vested with enough authority to dictate what shall be done as regards record-keeping and form-filling. It is only too easy for extra staff to be taken on and even departments formed for extracting data and putting it on forms and charts and making reports which may look efficient and nice but which are useless for all practical purposes.

This situation will not happen if those in authority never allow a record to be kept or a form to be filled in unless the

need for it can be clearly demonstrated. In addition, the very fact of using records as a check on efficiency will help to show up such a situation. Records systems must be made to fit the business and not the business to fit the records system.

In most businesses there will be a time period which can conveniently be considered as a unit. In most cases this will consist of the financial year of the business. A year, however, is too long a period to wait in order to check performance, so that it is necessary to break down the year into shorter periods. There are two systems mainly in use and these are as follows:

1. *The calendar month:* this is the older system and consists of using the twelve calendar months as units of accounts and records.
2. *The four-week period:* by this method the year is broken down into thirteen periods of four weeks each. The advantage of this system over the calendar-month system is that every period is exactly similar to every other and comparison is made easier. Also, periods are conveniently further broken down into weeks.

The exact form in which records are kept will vary according to the requirements of individual business concerns. The variety of business concerns is enormous and the system of keeping records and statistics must be planned in accordance with the exact requirements of the particular business. In general, however, the following main statistics will be useful to most manufacturing concerns.

1. SALES BY PRODUCT OR PRODUCT GROUP
   This breakdown will indicate the importance of each type of product in the income of the concern. Increases and decreases are immediately apparent. It also enables the effect of different marketing factors to be established for each product.
2. SALES BY AREAS
   Sales by areas can be further broken down into sales by salesmen's territories and is a useful aid to setting quotas. Increases and decreases can be immediately seen and

sales can be established as a percentage of the potential demand.

3. Sales Over a Time Period
   Analysis by time period enables seasonal fluctuations to be established and comparisons to be made from year to year.
4. Sales by Type of Outlet
   This is important in establishing the importance of different types of outlets (wholesalers, chain stores, independent shops, etc.). It is a useful check on the profitability of each type of outlet and useful in establishing trends in business, as an aid to advertising policy, etc.
5. The Number of Dealer Outlets
   It is important to know the number of outlets stocking the product in each area and as a percentage of the total number in each area. This will be useful as a check on the efficiency of salesmen or may indicate a necessary change in policy such as a greater use of wholesalers in an area.
6. Average Size of Order
   The size of order has a direct bearing on net profit. Obviously there must be a minimum size of order below which it is unprofitable to do business. It is also a useful indication as to whether a particular account should be continued.
7. Complaints Analysis
   Complaints and suggestions should not be forgotten once they have been dealt with, but should be classified according to type, source, dealer who made the sale, etc. This sort of analysis will provide many useful indications, as, for example, a continuous stream of similar complaints emanating from the same area obviously indicates the need for a local investigation.

These are by no means the only headings under which sales records and statistics can be broken down, and the system must be planned according to the needs of the business concerned. It is surprising, however, how many concerns do not

have any form of analysis of their sales records and consequently have no idea of the effect of their policy or indeed any idea of whether progress is being made except insofar as the business shows a profit or loss. A fall in turnover under these circumstances cannot be related to any factor or combination of factors, and it is consequently impossible to know what action to take except by a shrewd guess, which may or may not be right.

The maintenance of records and statistics is particularly important for measuring the effect of changes in policy, and records of any such changes should be noted on the record or statistic to which they are appropriate. For example, a change in advertising policy would be noted on the statistic of sales relative to the area covered by the change in advertising policy, and from that point onwards particular attention would be directed to the sales curve.

THE USE OF RATIOS

The pilot of an aeroplane uses a number of gauges and dials to help him navigate and fly his machine. These instruments do not do the job for him, but by reading them he knows if his course is right, and if it is not he puts it right; he can find out the speed of the wind, his altitude, his distance from the ground and a number of other things which help him to control his aircraft efficiently and avoid a crash.

Similarly, there are a number of ratios which can be used in business to measure its efficiency. They are not used to run the business; in fact they no more run the business than an altimeter flies an aircraft, but, like the altimeter, they give information to be acted upon by those who do control the business.

It can be said that the ultimate profit is the one criterion by which a business's efficiency can be measured, and similarly the fact of reaching its destination can be construed as proving that an aircraft has been flown efficiently. As long as it is daylight and the sky is clear the instruments have little value, but once these conditions cease to exist they may be the only factor which will guide the aircraft safely to its destination.

Just as in flying, so in business, as long as things are running smoothly a profit can be made without worrying overmuch how it occurred. But things do not always run smoothly and it is as well to have some method which will indicate a change as soon as it starts and which will show what progress is being made day by day and week by week when conditions are difficult.

In most businesses it can be established by experience what is the standard for each ratio, or if the business falls into a clearly defined industry it is often possible to obtain standard indices of efficiency for the industry as a whole, which will represent the average for that industry.

These ratios may be expressed in the form of a percentage or as a time ratio. The main types of ratios used in business are as follows.

FINANCIAL MARKETING RATIOS

The ratios being considered in this section are those which, though of a financial nature, have a direct bearing on the marketing and sales functions of a business. There are, obviously, other measurements of a purely financial character, but it is considered that these are, properly, the province of the accountant and they can be found in detail in accountancy text-books.

TURNOVER OF STOCK. This is the relationship between sales and the stock normally held. If sales average £100,000 over a period and stock averages £25,000 over the same period, the ratio is $\frac{100{,}000}{25{,}000} = 4$. The ratio 4 is then a standard; if it falls below 4, then there is too much stock and consequently too much tied-up capital and something must be done about sales. On the other hand, if the ratio rises above 4, stock is falling too low and action is again necessary to adjust it.

CAPITAL TURNOVER. This ratio is obtained by dividing net sales by total investment (total assets less current liabilities).[1]

[1] The amount of money invested in a concern is obtained by subtracting any current liabilities, that is, any sums the concern may be called upon to pay at short notice from its total assets, that is, fixed assets plus cash and stock. Thus, in addition to actual issued capital, any reserves, overdrafts, debentures or mortgages are also invested money.

What it does is to measure the number of times that capital is turned over during a business year. Comparison with the established standard will indicate whether the rate of turnover is increasing or decreasing. If it is decreasing, this means that the market conditions are changing. If market conditions are changing, this may indicate that the company's policy or product is not keeping step with consumer requirements, but before any change in policy is made it would be wise to investigate the market and discover the reasons for the situation.

PROFIT PER POUND OF CAPITAL INVESTED. This measurement shows how much is being earned for every pound invested in the business and is computed by dividing the net profit by the total investment. If the return on every pound is declining proportionately to the turnover of capital as indicated by the previous measurement, the company may well go out of business unless determined action is taken to readjust sales. This situation may be due to a variety of reasons, including falling sales or increasing costs.

FIXED ASSETS. Fixed assets are not trading commodities, and the more capital invested in fixed assets the less remains to be turned over by way of stock and sales. It is important, therefore, that the amount of capital invested in fixed assets be kept to a minimum. The ratio can be established by dividing total fixed assets by total investment, showing the result as a fraction or percentage. The trend can be established over a number of years and will indicate whether it is increasing or decreasing. If it is increasing, the company's assets are less liquid and action may be required to adjust the position.

TURNOVER OF RECEIVABLES. A company must know how efficiently its credit department is working. This ratio is obtained by dividing net sales by accounts receivable and the resultant quotient is then divided into 365 (the collecting period). If net sales are £100,000 and accounts receivable average £10,000, the sum $\frac{100{,}000}{10{,}000} = 10$ and $\frac{365}{10}$ gives an average of 36·5 days. If the company's credit policy is 30 days, then the credit department is falling down on its job and the company is financing its customers more than is allowed for.

GROSS MARGIN. This is arrived at by dividing the cost of the goods sold by total net sales and subtracting the quotient as a percentage from 100. Thus if the cost of goods is £75,000 and the net sales are £100,000 the quotient $\frac{75,000}{100,000}$ = 75 per cent. This subtracted from 100 gives 25 per cent. The gross margin is therefore 25 per cent, and the mark-up on cost is $\frac{75}{25}$ or $33\frac{1}{3}$ per cent. The importance of computing a gross margin and making comparisons with previous years is that a *declining* gross margin will reveal a trend which may be due to mark-ups being too low, an unsound marketing policy, high costs or slow-moving stocks.

COST RATIOS

Profit is directly related to costs, and one of the most important functions of management is the control of costs. There are certain ratios which can be established as representing standards of cost for a business, and the use of these ratios in controlling costs is invaluable.

THE BREAK-EVEN POINT CONCEPT. In every business there is a point at which income and expenditure break even. In other words, at this point income exactly covers the total of fixed costs plus variable costs. As income increases beyond this point so will profit increase, because fixed costs are already covered and variable costs in the form of materials and labour increase at a diminishing rate. Obviously this will not continue for ever because there comes a time at which fixed costs must also be increased or the law of diminishing returns will begin to operate. This need not concern us here; what is important is that for a given level of fixed costs there is a level of output at which profit will be maximised, and until this point is reached profits will increase at an increasing rate. Logically, then, the greater the volume of sales beyond the break-even point the greater the profit.

Every concern should be able to establish its own break-even point and for this purpose a break-even chart is used.

Break-even charts can be used for other purposes and are a useful means of showing graphically the relationship between various factors. The subject of break-even charts has been amply covered in several text-books and articles published in business journals, reference to these is given in the bibliography at the end of this book, and need not be covered here except to show its general conception. The following chart is shown in its simplest form and relates profit to sales, fixed costs and variable costs.

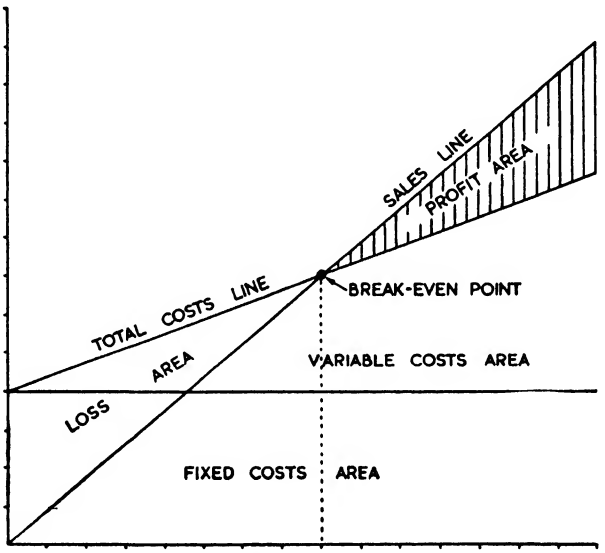


FIG. 1. BREAK-EVEN CHART

PROFIT PER SALES POUND. From the foregoing it will be obvious that since the profit per sales pound is directly related to costs, this ratio will be very useful for indicating in general terms the efficiency of the business. It is in fact one of the few measurements which provides an immediate key to the state of a business. As long as the trend is one of increase or stability there is little to worry about providing it is up to a previously defined standard. A decrease in the figure taken in conjunction with actual sales will point to the need for market investigation

or for an investigation into costs. This ratio is obtained by dividing net profit by net sales.

COST OF GOODS PER SALES POUND. This is a measurement of the proportion of each pound of income represented by fixed costs, labour costs, material costs and distribution costs. It is an index which provides a direct indication of the efficiency of management and is obtained by dividing the total cost of goods by total net sales.

GENERAL OVERHEAD EXPENSES. Since general overhead expenses are fixed costs it follows that any increase in these will move the break-even point so that more sales are required to achieve the same profit. If these expenses are shown in the form of a ratio to sales the trend should always tend to be a decrease in the ratio. If an increase is shown, this is again an indication of falling sales or increasing fixed expenses. There is, of course, no objection to increasing fixed costs as long as they are reflected in increased sales. A situation where the opposite is the case would indicate an unnecessary increase unless it has been made deliberately with a long-term objective in view.

DIRECT SELLING COSTS. These costs include salesmen's salaries, commissions, expenses, and should be shown as a percentage of the sales pound. By doing so an immediate check on the efficiency of the sales staff is provided. Such costs should be broken down into separate expense items so that a check can be maintained on such things as car allowances, etc.

PUBLICITY COSTS. These costs will include costs of advertising and various forms of sales promotion. A standard can be established as a result of experience in the form of a percentage of the sales pound. This does not mean that it must at all times be rigidly adhered to and it can be varied as long as there is a good reason for the variation. The object of the ratio is so that management can be aware of any variation and can if necessary enquire into the reason if it is not already known.

PHYSICAL DISTRIBUTION COSTS. By establishing this cost item as a percentage of the sales pound it is possible not only to keep a general check on the cost of deliveries, but also to

work out immediately whether a particular delivery is profitable or not. Obviously if 5 per cent is an allowable expense, a delivery of £5 worth of goods where the delivery cost is 15*s*. is eating into profits.

TOTAL OPERATING COSTS. Finally, total operating costs per sales pound can easily be computed by adding all costs together and dividing into total net sales. The resulting operating-expense ratio is easily compared with the norm of the company concerned as well as with the norm for the whole industry and for the particular company size. This will only give a general indication of the general health of a business, but any variations, once noted, can be followed by a more detailed investigation into causes.

The ratios discussed above are general and applicable to most forms of business. Individual concerns may need to use ratios specially adapted to their particular form of business. The factors which need to be high-lighted in this fashion can only be decided in the light of particular conditions, and it is the task of management to decide what forms of measurement it requires to keep itself informed of the health of the business so that it can control its efficiency.

Chapter V

EXTERNAL RESEARCH

THE TERM External Research is applied to any research which involves the collection of material from sources which are external to the concern doing the research or for which the research is undertaken. These sources are of two kinds: information can be obtained from PUBLISHED MATERIAL consisting of government and other statistics, the reports and results of surveys carried out by public and other bodies or from other forms of published material; or information can be obtained by the concern undertaking ORIGINAL RESEARCH involving the collection of external raw data either by observation or interview.

THE USE OF PUBLISHED MATERIAL

Although published material suitable for commercial and industrial purposes is not as prolific in Great Britain as it is in the U.S.A., there is still a vast amount of available data which can be used to good purpose. The market research department, or if no such department exists the marketing or sales department, of a business concern should compile an index of the available material and the sources of this material, which will be useful to the particular business. Much of the available material will not be in a form suitable for immediate use and will have to be carefully analysed before the facts that are required can be extracted.

Government Sources

THE CENTRAL STATISTICAL OFFICE publishes annually an *Abstract of Statistics*, which gives statistics of varying degrees of interest to different types of business concerns. These statistics

are in a condensed form and are compiled from data collected by government departments. A point of particular interest is that every table is accompanied by a note as to the source of the information so that, if further details are required, they can be readily obtained.

The abstract covers statistics on a wide variety of subjects including population, migration, education, labour, production, trade, transport, national income, prices, etc. There is a certain inevitable delay in publication which renders the information of little value for certain purposes, but since the sources are indicated, more recent figures are easily obtainable.

THE BOARD OF TRADE is obviously the government department to which business concerns should and do make reference most often. This department can provide a considerable amount of information on trade matters, much of which is published in its own journal. Of particular interest are the reports on the *Census of Production* which gives a wealth of detail about every industry in the country. In addition, the Board of Trade sponsors and carries out many overseas surveys and investigations, the results of which are of particular interest to exporters.

THE MINISTRY OF LABOUR publishes information on the state of labour and connected matters in its gazette. For example, statistics of the level of employment are provided for all major industries; these indicate the changes which occur from month to month. It also provides much information on changes in wages and on the hours worked in the different industries. The *Guide to Official Statistics, No. 1, Labour Statistics* is also a very useful booklet prepared by the Standing Interdepartmental Committee on Social and Economic Research and published in 1948, which indicates what information has been collected by the Ministry of Labour and where it is available.

Other ministries and government departments publish statistics and collect information, which is of use to the business concern. All of it is not published, but much of it can be obtained by reference to the department concerned, and such reference is often well worth while. For example, a manu-

facturer of perambulators can establish his potential market from year to year by obtaining the figures of births and expected births in various areas from the Registrar General and the Ministry of Health.

A "Consolidated List" of government publications is published annually in addition to which a "Monthly List" is published by the Stationery Office. Both are excellent guides to what is available and where, and should be consulted when information is required on particular subjects.

Trade Associations and Similar Bodies

Trade associations have available information of a general kind relating to the particular trade they represent. Some maintain special statistical services for the benefit of their members. A great deal of this information is published in the associations' journals, but obviously everything cannot be published and it is usually worth while approaching the associations when information is required.

These associations are also useful for the purpose of establishing standards of efficiency, since the information they possess will often lend itself to the computation of ratios comparable to those described in the previous chapter and applicable to the entire industry. For example, from the statistics it will be possible to compute the average turnover per man-hour or per man-year for the industry, or the average profit per pound capital.

Such figures will cover a wide range of sizes of concerns and a wide range in the efficiency of concerns, and will vary between two extremes, thus giving a range of standards. By comparing the figures of an individual business with the figures for the industry and by establishing its place in the range, taking differences in factors, such as size, into consideration, it is possible to set standards as a yard-stick against which to measure the efficiency of a particular business.

In making such comparisons, however, it is well to be aware of the possible dangers involved. For accurate comparison it is essential to compare like with like and to make certain that the terms used mean the same thing in every case. Similarly it is

necessary to ensure that the same time period is being considered.

Among the trade associations which provide an excellent information and statistical service of this kind are the Society of Motor Manufacturers and Traders and the British Electrical and Allied Manufacturers' Association.

Other bodies such as the Federation of British Industries and the various chambers of commerce are in a position to provide information of interest to most business concerns either through their publications or by direct enquiry.

Other Sources

There are certain other sources of information that are private undertakings and which provide a service, which can be subscribed to. A good example is the London Cambridge Economic Service. In addition to publishing information in their monthly bulletin which includes price indices, production indices, statistics on foreign countries, indices of purchasing power, etc., the service will also answer specific enquiries.

Certain professional journals such as *The Economist* and *The Statist* publish useful information and statistics, and similarly most trade journals. Business concerns will naturally subscribe to publications that are intimately connected with their particular business. All information appearing in these publications that is likely to be useful for future investigation should be indexed so that it can be readily referred to when required.

ASLIB, which incorporated the Association of Special Libraries and Information Bureaux and the British Society for International Bibliography, publish at irregular intervals in the form of pamphlets suitable for inclusion in a loose-leaf binder, *Aslib Guides to Sources of Information in Great Britain.* Each guide is compiled with special reference to a particular industry or interest and is particularly useful when information is required, the sources of which are not particularly well known to the enquirer.

The foregoing is but a brief outline of some of the sources

of published information. To list all the possible sources would require several volumes and is beyond the scope of this book. The purpose has been to indicate very briefly the various kinds of sources that are available so that the reader will know how to set about compiling his own index, which will be related to the specific needs of the industry or interest with which he is associated.

ORIGINAL RESEARCH

Market research can take the form of original external research by the manufacturer or distributor. It is a common fallacy to apply the term market research solely to this form of research, though internal research and external research of published data are just as much market research and are very often essential prerequisites to original research, either because they point to the necessity for it or because they provide the essential clues that will guide the investigation.

Original research involves the collection of raw data by interviewing or observing a predetermined section of the population, the tabulation, analysis, interpretation of the data and the presentation of the facts, which have emerged, in the form of a report in such a way that the facts themselves and their implications are easily understood by anyone possessing an average knowledge of the principles and methods of marketing and having a sufficient acquaintance with the business concerned.

This form of research is carried out by a survey of a statistically compiled sample of the universe relevant to the particular problem. It is only within the last thirty or so years that adequate techniques of sampling have been evolved.

In general a survey may be designed to measure behaviour or opinion and may be related to:

1. What has happened in the past.
2. What is happening in the present.
3. What may happen in the future.

It is important to note here that while public-opinion polls also use sample-survey methods, they attempt to measure not

only past and present behaviour and opinion, but also future behaviour and opinion, whereas market research is only concerned with the past and the present.

It is a fundamental principle of market research that people should not be asked questions to which they do not know the answers. Everyone knows for certain what he is doing now and what he did a short while ago, or what he thinks now and what he thought a short while ago, but no one knows for certain what he will think or do in the future. He may have future intentions, but these may be changed by future and unknown circumstances. Only a guess can answer a question on the future.

The strength of market research lies in the fact that it is concerned with people's habits and preferences for material things which are not altered by emotions. These habits and tastes are, of course, continually changing, but they change slowly and these changing trends can be measured, and by intelligent interpretation they can be projected into the future. Unlike political opinion, for example, they are not subject to peaks of intensity at election time.

Normally, research should be a continuous process, which will enable the performance of a business or product to be measured continually. On the other hand, specific problems may arise necessitating single surveys specially designed to deal with them. Continuous research may be compared to a newsreel depicting a race from start to finish and showing the continuous performance of the respective horses; a single survey, on the other hand, would be comparable to a snapshot of the race giving a picture of the event at a particular moment of time.

There are two main fields of investigation for original research. The first consists of the trade, involving investigations among wholesalers, dealers and other trade interests; research of this type is termed TRADE RESEARCH. The second consists of the final consumers of the products (i.e. the general public) and is termed CONSUMER RESEARCH.

TRADE RESEARCH

Trade research is the name given to that part of research which is concerned with the way in which a product reaches the final consumers and the people or trade agencies through whose hands it passes on its way to the final consumers.

Most concerns will have on their files a considerable amount of information about the trade channels they use and the dealers who distribute their products. A large part of this information will consist of travellers' reports. While it is part of a traveller's job to report on his customers and while such information is extremely valuable, there can be no guarantee that it is entirely objective. Indeed, since travellers have an immediate interest in their customers, their reports will often be biased, however innocently.

In spite of the usefulness of travellers' reports, it would, then, be dangerous to rely on them entirely for any purpose which might involve the interests of the travellers, or to accept without question statements which touch travellers' interests closely. The only safe method of obtaining entirely reliable and objective information about a concern's dealers is to use trade research which can be either continuous or consisting of one or more single surveys.

CONTINUOUS RESEARCH

Continuous research will normally consist of a continuous survey by the purchase and inventory audit method. This method consists of arriving at estimates of sales by a physical check of retailers' stocks at fixed intervals and counting their purchases during the period that has elapsed since the last check.

The main advantage of this type of research is that it will show a manufacturer what are the total sales for a particular kind of product, and total sales will be broken down into sales by different brands, including his own. This enables him to watch the progress of his brand in relation to (*a*) total sales, and (*b*) other brands.

Supposing that a manufacturer of a breakfast cereal discovers that his factory sales have increased by 2 per cent over a period, he may feel well satisfied. If, however, he sees the results of a retail audit and finds that over the same period total sales have increased by 10 per cent he will be anything but satisfied; in fact a competitor will have taken up some of the additional market which should have been his and he will rightly want to know why. The retail audit will tell him who this competitor is and he will thus be in a position to investigate the reasons for a situation of which, but for the retail audit, he would not have been aware.

This method will also enable a manufacturer to keep production in step with demand. He will be aware of the exact time lag between his factory sales and sales to consumers and will be in a position to alter production when necessary to meet changes in consumer demand. In fact, by continuous research of this nature a manufacturer is enabled to keep his finger on the pulse of his particular brand market.

In addition, changes in the proportion of dealers and consumers having the product will be revealed. Changes in the number of brands stocked related to types of outlets, changes in the size and frequency of purchase related to type of consumer will also emerge as a result of continuous research.

SINGLE-SURVEY METHOD

Continuous research of the kind described above, while keeping a manufacturer informed of the changes in the market, will not tell him the reasons for these changes. Of course, it is a great advantage to know what changes are occurring, but the manufacturer who wants to go further than this and find out the reasons for these changes so that he can follow up an advantage, or check a weakness, will need to use the single-survey method.

By the skilled interrogation of a cross-section of dealers it is possible to discover the more intangible factors which affect a manufacturer's distribution, e.g.:

1. Why some dealers stock some brands and not other brands.
2. The reasons why they have ceased to stock some brands.
3. Why they have never dealt in other brands.
4. Which brands they push and why they do so.

The single-survey method can also be designed to tell a manufacturer the relative importance of the different brands on the market, but such information will not be as accurate as that which is provided by the continuous method, and from the very fact that it is not continuous it will not reveal changes except perhaps in very general terms.

Single surveys among dealers will, however, give a manufacturer vital information about the strengths or weaknesses in his marketing and sales policy or in his representation. Sometimes they will uncover the existence of unpublicised deals and special terms offered to dealers by his competitors and will show what influence they exert on dealers. Such surveys will also frequently reveal the mistakes of competitors and their effects and will enable a manufacturer to learn inexpensively from the possibly hard experience of others.

By comparing products, prices, advertising and other factors a manufacturer will arrive at certain conclusions and will develop certain ideas; these can all be checked by the survey method. In addition, he can obtain information about dealers' buying habits and their requirements. He can find out who are their suppliers, in what quantities they normally order and how often they order, the size of the stocks they normally hold, how their supplies are stored and whether they are liable to suffer deterioration and through what causes.

This information may reveal, for example, the need for an improved pack to prevent deterioration or for a different design. It may also reveal the need for more frequent calls by representatives or more effective point-of-sales advertising. In fact, such information will indicate how a manufacturer can improve the characteristics of his product and what service and help he can give his own travellers, agents and dealers in order to improve sales.

On the part of advertising and sales promotion he can discover the relative values of different types of trade advertisements, the value of display material and how it can be improved, the value of distributing samples and sales literature and the effect of each on his eventual sales.

CONSUMER RESEARCH

Consumer research is probably that part of market research which is best known generally. There are all too many people who believe it to be the only branch of market research, little realising that it is but one aspect of the whole subject. This is perhaps because it is based almost exclusively on the principles of sampling.

If a business concern is to achieve good relations with its customers, that is the ultimate users of its products, whether they are processors and manufacturers or members of the general consuming public, two things are necessary:

1. The concern must get to understand its customers.
2. The concern must get its customers to understand it.

In a small business, such as the grocer round the corner, this does not present much of a problem, because customers are relatively few and personal contact is maintained. But where a concern is big enough to be divorced from its customers the problem assumes different proportions. The products of the business will be sold through agents, wholesalers, retailers and possibly through other intermediaries. The concern no longer has direct contact with its customers, and every link widens the gap between the two. Even departments within the concern will tend to increase the distance between the producing end and the consuming end. It is sometimes an eye-opener to meet manufacturers who have not the faintest idea who buy and use their products.

Consumer research has been evolved because of the need to bridge the growing gap between producer and consumer.

Before Large-scale Industrialisation

There were only two links in the chain. The producer designed, made and sold his goods direct to the consumer. Before he began to make the goods the producer would discuss with his customer exactly what he wanted and would give him the benefit of his experience.

FIG. 2a

Business Today

Large-scale industrialisation creates a gap between the consumer and those who decide what is going to be made and how it is going to be sold. A link is created between the sales department and the consumer by advertising, which tells the consumer about the product and the manufacturer; it is, however, only a one-way link and does not tell the manufacturer anything about his customers.

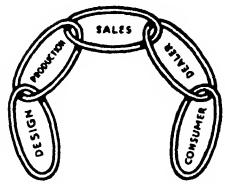


FIG. 2b.

Consumer Research

Consumer research provides a means of assessing the consumer's attitude towards the product. It shows how effective the sales department is in selling the product, how effective advertising is in advertising the product and to what extent the product meets the needs of consumers and is acceptable to them.

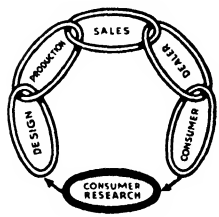


FIG. 2c.

The use of consumer research is not solely confined to producers of consumer goods. Wherever there is a product there must be consumers, and it is important to know the consumers and their reactions to the product. Consumer research can be applied with equal success whether a product or a service is being sold; whether the product is factory plant or knitting needles; whether the service is insurance or cleaning windows.

Before consumer research is accepted as a necessary adjunct to the operation of a business, it must first be properly understood by those who run the business and its true place and value

Diagrams reproduced by courtesy of General Motors Corporation Customer Research Staff, Detroit, Michigan.

appreciated. Consumer research has in the past only too often been regarded with suspicion and this suspicion has been brought about by several factors.

1. It is a comparatively new idea and has sometimes in the past been practised by persons who were not qualified to do so or were plain racketeers.
2. It appears to be expensive if it is not properly related to results. A manufacturer can seldom see what he will get out of it when he is first tempted to use it.
3. It is sometimes difficult to see exactly how it fits into an existing organisation.
4. It may appear to interfere with the established functions of departments and may consequently meet with opposition from departmental heads.
5. Consumer research has developed rapidly in the last few years and many new techniques have been evolved. It is not always easy to understand the scope and use of each.

As in the case of trade research, consumer research can be either continuous or it can consist of single surveys.

CONTINUOUS CONSUMER RESEARCH

This type of research will keep a manufacturer continually informed of changes that are occurring in his market. It will tell him of the changing habits of consumers and their changes in attitude towards his products or those of his competitors.

Continuous research is important in evaluating changes in the number of consumers having the product and consequently changes in the size of the market. It will, therefore, bridge the time lag which is inevitable before changes in demand are felt in the factory through the normal channels of distribution.

SINGLE SURVEYS

As with trade research, single surveys are not so accurate as continuous research in giving a quantitative analysis of the market; they are, however, more useful in giving a qualitative analysis. That is in giving the reasons for consumers' preferences for certain brands, why they no longer use brands they used to buy, why they have not tried others. Again, why they prefer to buy certain articles in certain shops, or what influenced their decisions and how they have been impressed by different advertisements.

Reasons for consumers' actions or attitudes may be quite practical and may relate to such things as price, usefulness, taste, efficiency, economy, etc. On the other hand, they may be utterly irrational, such as not buying a product because the advertising is "low class". What consumers think they know is as important to a manufacturer as what they know or don't know.

Briefly, consumer research will help a manufacturer to adapt his products and methods of distribution to consumers' needs in the following ways:

1. By enquiry among consumers it is possible to discover the reasons that first influenced them to buy the manufacturers' product or that of his competitors; why they continue to buy the brands they do or why they have changed brands. Such enquiries will help a manufacturer to decide new methods of marketing, selling and advertising.
2. It is also possible to determine what efforts are likely to be effective, and how effective they are likely to be in expanding the sale of the product, by extending the range of consumers who use it or the occasions on which they use it, or by increasing the uses to which the product can be put.
3. The power and effectiveness of various advertising or publicity appeals can be determined in relation to the media which carry them by a careful study of the motives which influence consumers as well as their fears and aspirations.

It is also important to know the state of the market, whether it is expanding, whether it is static or contracting. Again, for the purpose of forecasting sales as a basis of business forecasting and budgeting, consumer research can be useful in determining the size and pattern of the market and the changes which are occurring in the market trends.

Chapter VI

SAMPLING THEORY

FUNDAMENTAL STATISTICAL PRINCIPLES

Before the actual methods used in market-research surveys can be properly understood, it is necessary to have some knowledge of the theory of sampling. Trade research and consumer research are usually based on the surveying of a sample of either dealers or consumers, as the case may be.

Now, what is a sample? In market research the term sample is used in the same way as in any other connection. In the same way as a sample of a chemical or other substance may be taken for analysis in the laboratory, so a sample of a given population can be taken for analysis by market research. The methods will naturally be very different in each case, but in the same way as the make-up of a substance can be determined by analysing a sample of that substance, so can the make-up of a given population be determined by analysing a sample of that population.

A sample is, however, only a sample, and although in some cases it will have exactly the same characteristics as the population from which it is taken, it is impossible to be certain of this fact, and the most that can be said is that it is accurate to within certain limits. This is important from a market research point of view because these limits are very largely determined by the size of the sample. Too small a sample may contain a possible error so large that no definite conclusions can be arrived at; on the other hand, if the sample is unnecessarily large the cost of the survey will be increased without materially increasing its accuracy.

Another point of importance in market research is that in order to determine whether any particular finding is significant or not, it must be possible to determine the inherent error of

the sample itself. Both the method of determining the size of the sample and the significance of the results will be explained later in this book.

There are two fundamental statistical laws on which sampling is based and, although these laws are seldom quoted in textbooks on market research, they are simple to understand and, indeed, make the understanding of sampling easier.

The Law of Statistical Regularity

"Any group of objects taken from a larger group will tend to possess the same characteristics as that larger group."

Applied to market research, this principle means that if a group of people is taken at random from a larger group of people the smaller group will tend to possess the same characteristics as the larger group in the same proportions.

As an illustration of this principle, consider the analogy of a cake, well mixed and containing four hundred currants and one hundred sultanas. If a segment of the cake is taken which is exactly one-tenth part of the whole cake, the chances are that it would contain nearly forty currants, say something between thirty-five and forty-five, and nearly ten sultanas, say something between five and fifteen.

The Law of the Inertia of Large Numbers

"Large groups are more stable than small groups."

In other words, the characteristics of a large group are less likely to change than those of a small group. In a thousand people, 50 per cent of whom smoke, there is less likelihood of any marked change occurring in this proportion than in, say, a group of two, 50 per cent of whom also smoke. Obviously in the smaller group if one person takes up smoking or stops smoking a 100 per cent change will take place in the proportion.

It is important to grasp the reason for this stability. It is simply that any change occurring in some of the units that make up the group are more likely to be cancelled out by reverse changes taking place in other units within the group. Thus changes in one direction are balanced by changes in the

opposite direction and the average of the group tends to remain the same.

This has an important bearing on the size of the sample. The larger the sample the more likely are differences within the sample to cancel out one another, and therefore the more likely is the average measurement of the sample to correspond to the actual average of the group from which it is taken.

Reconsider the example of the cake. If instead of a sample of one-tenth part being taken a sample of three-tenth parts were taken, the following might be the resulting count of currants and sultanas for each tenth:

First tenth	— 35	currants,	13	sultanas.
Second ,,	— 43	,,	9	,,
Third ,,	— 41	,,	7	,,
Total	— 119	,,	29	,,

Now the averages of these results in respect of one-tenth part of the cake are respectively $\frac{119}{3} = 39{\cdot}66$ currants, and $\frac{29}{3} = 9{\cdot}66$ sultanas, which is much nearer the actual proportions for the whole cake than any of the individual tenths taken.

MEASURES OF CENTRAL TENDENCY

Before it is possible to grasp the technicalities and statistical principles involved in sampling it is necessary to understand the elementary concepts of central tendency.

A measure of central tendency is a number which represents a middle value in a series of observations and which conveys an impression of the whole series. The most commonly used and most useful measure of central tendency is the ordinary average or arithmetic mean. There are other measures of central tendency, namely the median and the mode, but it is not proposed to discuss these here as they will but serve to complicate the discussion.

To obtain the mean or average of a series of measurements, all the measurements are added together and the sum is divided by the number of measurements.

For example, the measurements relating to the height of ten men taken at random might be as follows: 5′, 5′ 5″, 5′ 6″, 5′ 7″, 5′ 7″, 5′ 9″, 5′ 10″, 6′, 6′, and 6′ 1″. By adding these ten measurements together the sum 56′ 9″ is obtained. This is the sum of the measurements; but since we require to know the average height of the ten men, it is now necessary to divide this sum by 10, the number of measurements taken or the number of men in the group: thus $\frac{56' 9''}{10} = 5' 8{\cdot}1''$ and this is the average height of the group.

The object of an average, or any other measure of central tendency, is to enable a whole series of measurements or observations to be represented by one measurement which will show the general characteristic of the series. It should be noted that the mean is not necessarily one of the actual measurements, though it can be.

A casual glance at the measurements taken of the heights of the ten men would impress on our mind that the average height lay somewhere between the two extremes, that is, between 5′ and 6′ 1″ and we would tend mentally to halve the difference and say that the average height was about 5′ 6″. By doing this we should have disregarded the fact that within the group there was a tendency to tallness which is more accurately represented by the average 5′ 8·1″.

As the number of observations increases, so it becomes more important to establish an average measurement which will express the tendency of the series. It is difficult for the human mind to grasp fully the meaning of a hundred or a thousand observations; by taking the average of the series, however, a measure is obtained which expresses in general terms the tendency of that series.

SCATTER OR DISPERSION

While the average or mean does represent the general tendency of a whole series of observations, it does not by itself give enough information about the series to enable it to be understood very clearly. As a general rule, in order to understand fully the

meaning of such a mean or average, it is also necessary to know how the observations are scattered about their mean. Obviously the mean of a series of observations that lie closely grouped about their mean is much more reliable as a representative statistic than the mean of a series where the observations are widely scattered.

To illustrate this principle, assume that the continuous horizontal lines in the following two diagrams represent the respective means of the two series of observations. It will be seen that the mean of the series in the first diagram will give a much more accurate picture of the whole series of observations than the mean of the second series.

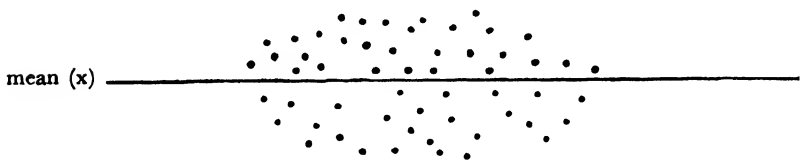


FIG. 3. CLOSELY GROUPED SERIES

Although in both these series the mean might be identical, e.g. (x), in the first series the weight of the observations is concentrated at the mean itself, whereas in the second series the weight of the observations is concentrated some distance on either side of the mean. Obviously if some further measurement, indicated by the broken lines in the second diagram, is given to indicate the position of this concentration, a much more accurate picture is obtained. In other words, it is necessary to know the way in which the observations are scattered about their mean.

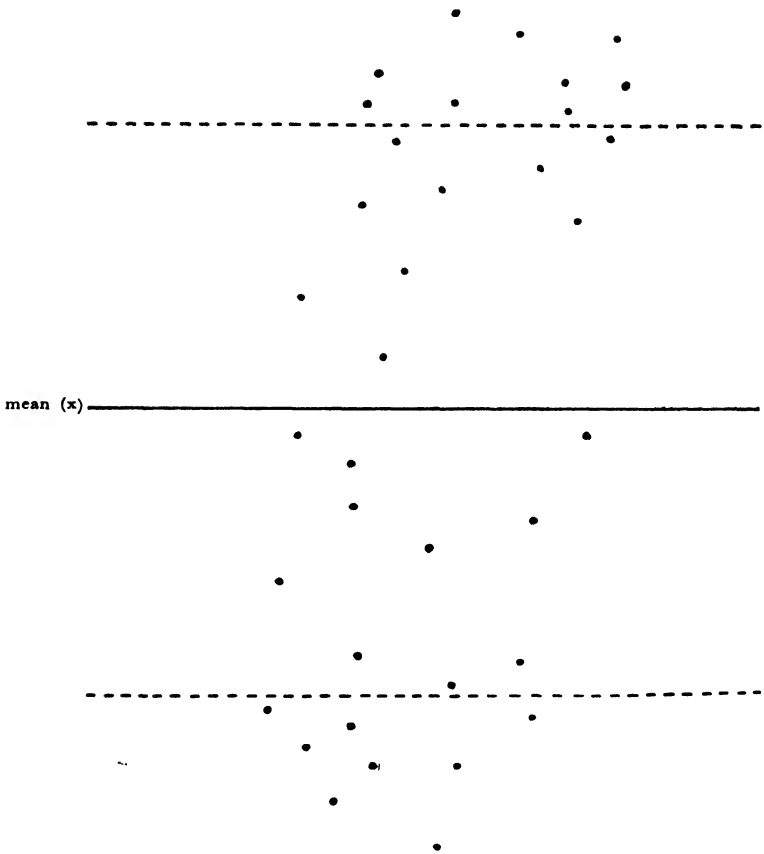


FIG. 4. DISPERSED SERIES

To revert to the example already given, where the heights of ten men were measured, suppose that it was found that the measurements were as follows:

2 men measure 5′ 5″
3 men measure 5′ 6″
3 men measure 5′ 7″
2 men measure 5′ 8″

the average height would be:

$$\frac{(2\times 5'\ 5'') + (3\times 5'\ 6'') + (3\times 5'\ 7'') + (2\times 5'\ 8'')}{10}$$

$$= \frac{55'\ 5''}{10} = 5'\ 6{\cdot}5''.$$

Now if this series were represented diagrammatically we should have the following picture:

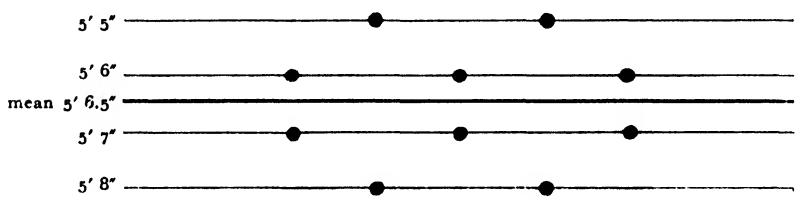


FIG. 5. HEIGHTS OF TEN MEN CLOSELY GROUPED

It will be seen that the measurements lie close about their mean and as a result a fairly accurate measure of the whole series is obtained by simply taking the mean of the series although the actual mean is not one of the observations.

Now let us look at the actual measurements given in the original example. If these are represented diagrammatically a very different picture is obtained, as in the following diagram:

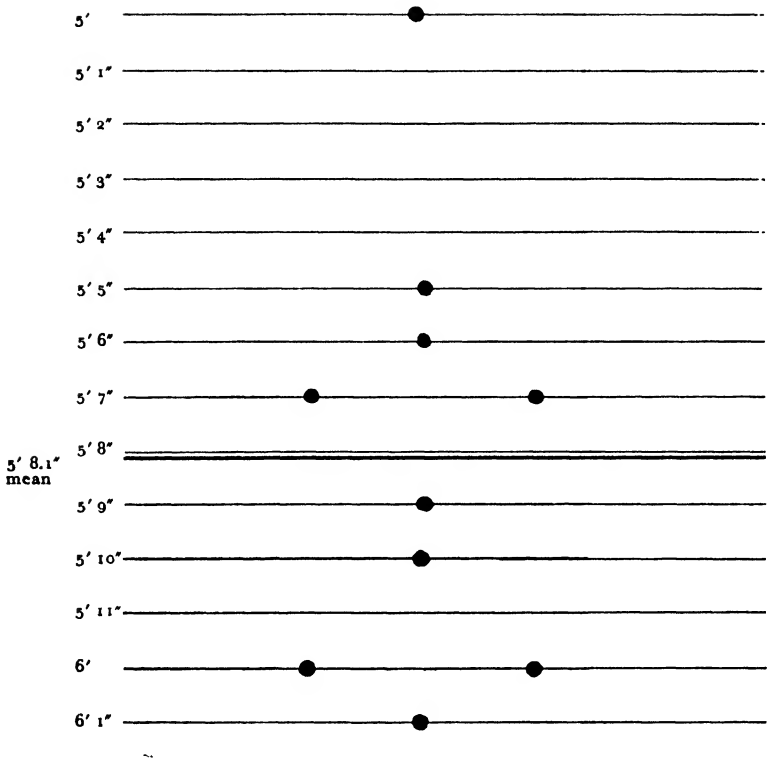


FIG. 6. HEIGHTS OF TEN MEN DISPERSED

In this diagram it will be seen that the scatter is much more pronounced. Notice the lowest measurement (5′) which is a considerable distance from the mean. In fact the extremes of the series are so wide apart that some indication of the scatter is necessary before the mean has much significance as a representative statistic. As the number of observations in a series increases and they become more widely scattered, it will be obvious that the need to measure the scatter becomes increasingly important.

In the previous examples the sample, or the number of observations, has been small and the diagrams illustrative rather than accurate. This has been done with the object of giving an easily understood exposition of the basic principles. In the following example, however, it is intended to crystallise what has already been said.

A series of a hundred observations is taken representing the heights of a group of a hundred men. The results of these observations are shown in the following tabular form, where column (x) represents individual measurements of height, column (F) the number of times or the frequency with which each individual height occurs, and column (S) the totals for each measurement (column (x) multiplied by column (F)).

x	F	S ($x \times F$)
5′ 2″	8	41′ 4″
5′ 3″	11	57′ 9″
5′ 4″	12	64′
5′ 5″	15	81′ 3″
5′ 6″	26	143′
5′ 7″	13	72′ 7″
5′ 8″	10	56′ 8″
5′ 9″	0	0
5′ 10″	3	17′ 6″
5′ 11″	2	11′ 10″
	100	545′ 11″

TABLE I. FREQUENCY DISTRIBUTION

Notice that since there are one hundred observations, column (F) must total 100. The total of column (S) gives the total of all the measurements as if all the men were laid head to foot and an overall measurement taken.

The mean of this series is obtained quite simply by dividing the total 545′ 11″ by the number of observations, 100. Thus

$$\frac{545' \, 11''}{100} = 5' \, 5{\cdot}51''.$$

Now if a graph is plotted showing the frequency with which each observation occurs, it will be seen how these observations are scattered about their mean. In the following graph the frequency with which the observations occur is measured vertically and the values of the measurements in terms of feet and inches are measured horizontally.

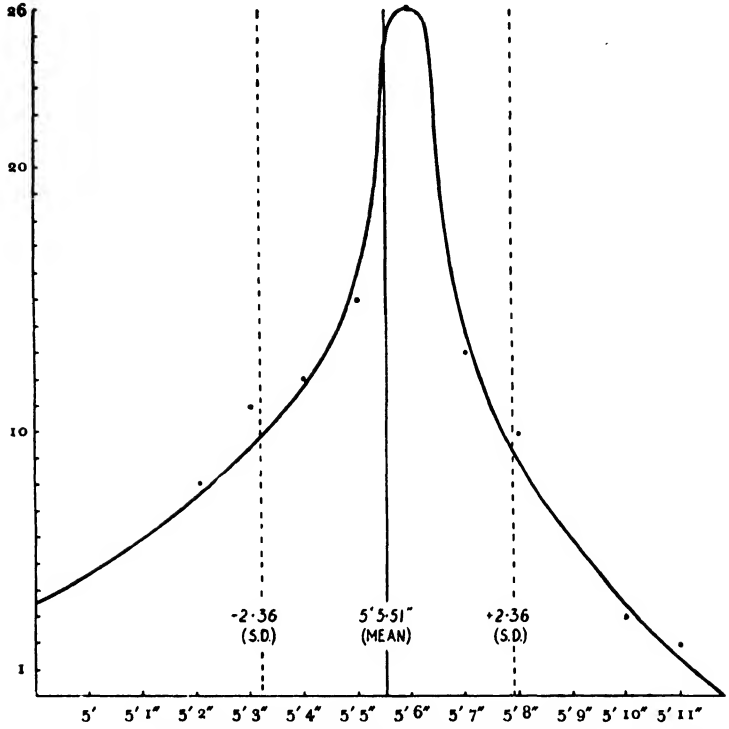


FIG. 7. DISTRIBUTION CURVE OF THE HEIGHTS OF 100 MEN

In this example it will be observed that 46 observations fall to the left of the mean and 54 observations fall to the right. The mean itself is very close to the peak of the curve. It does not, however, by itself give any indication of the scatter of the observations on either side.

Except for observations, whose values are exactly that of the mean, each observation DEVIATES to some extent from the mean; this is known as the deviation from the mean. In order to obtain a measurement of the scatter, however, we are not so much interested in the individual deviations of the observations as in their combined deviation, and for this purpose we measure the average deviation from the mean or the mean deviation of the series.

STANDARD DEVIATION

There are several methods of measuring the mean deviation of a series of observations, but by far the best method and the most widely used is that known as the *standard deviation* represented by the Greek letter sigma, σ. For the purpose of this book it is unnecessary to complicate matters by discussing other methods of measuring the mean deviation, and in any case they will be found described in the standard text-books on statistics.

Rule for Obtaining the Standard Deviation

The standard deviation is obtained by taking the square root of the sum of the squares of the deviations from the mean divided by the number of observations.

If $\bar{x}$ represents the mean of a series and $(x - \bar{x})$ represents the deviation of any observation from the mean, then the sum of the deviations of all the observations will be $S(x - \bar{x})$.

The sum of the squares of these deviations will be $S(x - \bar{x})^2$ and the standard deviation, σ, will be given by the formula

$$\sigma = \sqrt{\frac{S(x - \bar{x})^2}{N}}$$ where N is the number of observations.

Now, in order to illustrate how this works out in practice, let us apply this calculation to the previous example. To illustrate the working more clearly it will be useful to set it out in the following table.

X (Value of observations)	F (Frequency of observations)	$(x-\bar{x})$ (Deviation from mean)	$(x-\bar{x})^2$ (Deviation squared)	$F(x-\bar{x})^2$ (F multiplied by deviation squared)
5′ 2″	8	3·51″	12.32	98·56
5′ 3″	11	2·51″	6·30	69·30
5′ 4″	12	1·51″	2.28	27·36
5′ 5″	15	·51″	·26	3·90
5′ 5·51″	— (mean)			
5′ 6″	26	·49″	·24	6·24
5′ 7″	13	1·49″	2·22	28·86
5′ 8″	10	2·49″	6·	60·
5′ 9″	—			
5′ 10″	3	4·49″	20·16	60·48
5′ 11″	2	5·49″	30·14	60·28
	100			414·98

$$S(x - \bar{x})^2 = 414{\cdot}98.$$

TABLE II. FREQUENCY DISTRIBUTION OF DEVIATIONS

X refers to the values of the observations. F refers to the frequency with which the respective values occur. $(x - \bar{x})$ is the deviation of individual values from the mean (5′ 5·51″). $(x - \bar{x})^2$ is the square of the deviations. $F(x - \bar{x})^2$ is the square of the individual deviations multiplied by the number of times they occur.

The sum of all the $F(x - \bar{x})^2$ items is 414·98, hence this total represents *the sum of the squares of the deviations from the mean or* $S(x - \bar{x})^2 = 414{\cdot}98$.

Now to obtain the standard deviation of the series it is necessary to take the square root of the sum of the squares of the deviation from the mean (414·98) divided by the number of observations. Hence:

$$\sigma = \sqrt{\frac{414{\cdot}98}{100}}$$

$$\sigma = \frac{23{\cdot}6}{10}$$

$$\sigma = 2{\cdot}36 \text{ (approx.)}.$$

The standard deviation of this series is, therefore, 2·36. If in Fig. 7 the position of the standard deviation is marked by a vertical dotted line on either side of the mean, we have an indication of the average scatter of the observations about their mean.

Although it is a simple matter to work out the mean of any series of observations, when such a series represents only a sample of a much larger group it is impossible to say what is the value of the mean of the larger group, and the mean of the larger group will not necessarily correspond to that of the sample.

By establishing the standard deviation, however, it is possible to define with a high degree of accuracy the limits within which the mean of the larger group must fall and it is in this that the value of establishing the standard deviation lies when using the sampling method.

In the example given, the mean of the sample is 5′ 5·51″ but the mean of the group from which this sample was taken

will not necessarily be the same. It is, however, possible to say with a certain degree of accuracy that the mean of the whole group will fall within the limits + 2·36 and − 2·36 from the mean of the sample. The degree of accuracy with which this can be said depends on certain factors which will be considered later.

The important thing to remember is that the value of the mean of the larger group from which the sample is taken is *not known* and can never be known unless the entire group is measured. To do so would be defeating the object of sampling, but by establishing limits within which the value of the mean of the larger group must fall a sufficient accuracy is obtained, certainly for any business purposes.

Chapter VII

SAMPLING THEORY (Continued)

THE STANDARD ERROR

In the previous chapter certain fundamental statistical principles and methods have been described which culminated in a discussion on the standard deviation. Although a thorough understanding of these principles is necessary for the further study of the theory of sampling, the standard deviation as such is not used in market research. A variation of the standard deviation, known as the standard error, is commonly used for purposes of market research.

The standard deviation is used when considering values which are measurements, such as the heights of men, the lengths of poles, the weights of articles, etc. In market research results usually occur in percentages or proportions, the proportion of men to women or the proportion of respondents giving an affirmative or negative answer, etc. These proportions, when dependent on a sample of the population, or of a particular group, are subject to a standard error, and it is this error which it is necessary to measure.

Supposing that in a survey a proportion, say 40 per cent, of the respondents gave an answer A. What is the standard deviation of 40 per cent? Obviously there is no way of computing a standard deviation for such a figure and the question is absurd. If, however, a survey were repeated a large number of times, we should obtain varying proportions, 43, 42, 41, 38, 40, 37 per cent, etc., and it would be possible to establish a mean of the results and work out the standard deviation.

For example, in a survey to ascertain the number of people using a certain brand of breakfast cereal, if the survey were repeated a number of times using the same question but different samples, the following might be the resulting percentage:

		Percentage
1st	survey	40
2rd	,,	35
3rd	,,	41
4th	,,	37
5th	,,	38
6th	,,	42
7th	,,	41
8th	,,	38
9th	,,	35
10th	,,	37

If these proportions or percentages are considered as measurements of the popularity of the breakfast cereal, on the basis of what has already been said, it would be possible to work out the mean of the series and also to establish the standard deviation of the series. Now this is bringing us very close to what we need.

In practice it would be cumbersome to carry out a number of small surveys, as well as expensive. It is, therefore, necessary to be able to establish the standard error for a given sample size in advance, so that the minimum size can be determined. Since a survey only considers what is, after all, only a small sample of the universe, it is impossible to establish the *actual* proportion of people, who act in a certain way, from the sample alone, but by determining the standard error of the sample it is possible to say with a predetermined degree of accuracy that the actual proportion in the universe must fall within certain limits.

Supposing a certain question is asked of all the inhabitants of a certain area, and a fraction p of them give an answer A. The remainder, a fraction q, must give some other answer, and $p + q = 1$. As in practice it is not possible to interview all the inhabitants, we must be content with interviewing a sample of the population, and it can be assumed on the basis of the Law of Statistical Regularity that the proportion giving an answer A will still approximate to p.

If the selection of the sample is done entirely at random, and every person has an equal chance of selection, it is possible

to determine mathematically how big an error is likely to occur through taking a sample instead of the entire population. In practice, however, it is now more usual to stratify the sample in accordance with certain known characteristics instead of choosing an entirely random sample. This procedure makes the results very much more accurate than when a strictly random sample is taken, but it also makes it extremely difficult to work out the exact size of the error which is likely to occur. It must, however, be stressed that this is only true if the sample is a *true* cross-section of the universe. The stratification must be accurate if a biased sample resulting in erroneous data is to be avoided.

In practice, however, the usual procedure is to work out the error as though the sample had been an entirely random one. The actual error will, in fact, be less, but since this is an inaccuracy in the right direction and has little influence on a normal market research sample, it can safely be ignored.

The calculation of the standard error is similar to that of the standard deviation and is based partly on certain mathematical calculation and partly on certain assumptions proved by experience. There is no real necessity for anyone to know the mathematics involved as long as the principles on which the method is based are understood.

If a sample of N interviews is taken and repeated again and again with different samples but using the same question, the proportion giving an answer A will be found to approximate to the right proportion p. If the proportions giving the answer A are plotted horizontally and the number of samples for which these proportions give that answer (the frequency of occurrence) are plotted vertically, the resulting graph would have one of the shapes shown in the diagram at Fig. 8.

If the proportion p represents the actual proportion in the population, then that proportion represented by the peak of the graph will occur most frequently. Proportions close to p also occur frequently, but those proportions which are further from p occur less frequently and will occur less and less frequently the further they move from p. It is worth noting that the curve is symmetrical, so that proportions less than p are just as likely to occur as proportions greater than p.

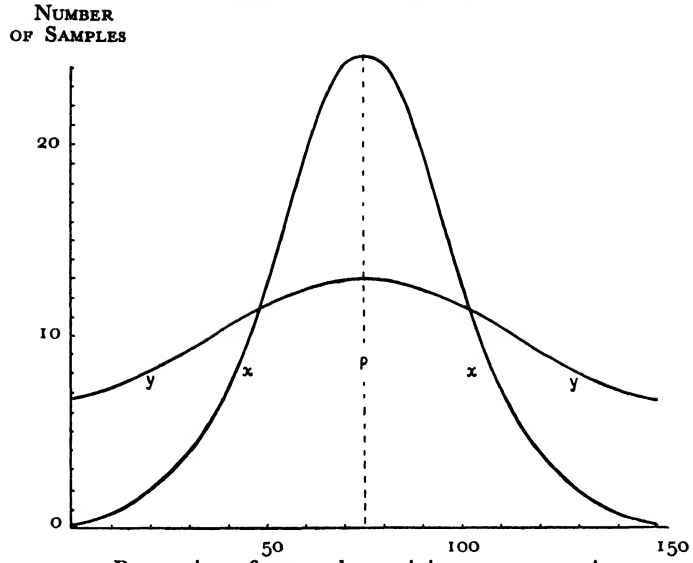


FIG. 8. TALL AND FLAT SYMMETRICAL CURVES

Although the curve is of the general type x, it may be more or less flat like the curve y. Both are normal curves and have their peak at the same value of p, but the proportions actually found for different samples will vary more for the flat curve than for the tall one. The actual shape of the curve varies with different samples and the flat curve merely means that the results are more widely scattered. The importance of knowing whether the curve is likely to be normal is that calculations of standard error are only true for normal curves. In market research the curves approximate to normal for samples of more than about fifty.

As in market research it is not normal to do a large number of single surveys, the scatter is found without doing repeated surveys by using the standard deviation as a measure of scatter. The standard deviation has already been defined as the square root of the sum of the squares of the deviation from the mean divided by the number of observations.

If the standard deviation is σ, the number of samples N, and the proportions of people giving an answer A in the first,

second, third, etc., samples differ from the mean by x_1, x_2, x_3, etc., then

$$\sigma^2 = \frac{x_1^2 + x_2^2 + x_3^2 \ldots \text{etc.}}{N}$$

or

$$\sigma = \sqrt{\frac{x_1^2 + x_2^2 + x_3^2 \ldots \text{etc.}}{N}}$$

When there is a wide scatter, i.e. a shallow curve, x_1, x_2, x_3, . . . etc., will be large and σ will be large. When there is a small scatter and a tall curve, x_1, x_2, x_3, . . . etc., will be small and σ will be small. The size of σ, therefore, gives a measure of the scatter of the proportions found in the different samples, who give an answer A, and so of the shape of the curve.

The value of σ can be worked out approximately from a single survey and will give the standard error of the sample. It can be shown mathematically that when the replies of N people must be either A or something else, and when the proportion answering A is p, and the proportion giving some other answer is q, so that $p + q = 1$, $\sigma = \sqrt{\frac{pq}{N}}$.

This formula will give the standard error for any sample and also holds good when p and q are percentages instead of fractions; σ is then expressed as a percentage.

PROBABLE ERROR OF A SAMPLE. The standard error of a sample can only be determined when the results of the survey are available; in other words, when the proportions giving different answers are known. In order to determine the size of the sample required BEFOREHAND, it is necessary to determine what is likely to be the standard error or, in other words, to determine the probable error.

In some cases some idea of the proportions giving different answers will be had beforehand, but if it is impossible to know what the proportions are likely to be, the probable error can be worked out as for the worst possible case. It will be seen that whatever the sample, the worst possible case, or the case

where the numerator is largest, thus giving the greatest error, will be when p and q are equal.

Supposing that in a survey a proportion of 50 per cent give an answer A, then (100-50) per cent must give some other answer. If the sample is 2,500, by using the formula, we have

$$\sigma = \sqrt{\frac{50 \times 50}{2500}}$$

$$\sigma = \sqrt{\frac{2500}{2500}}$$

$$\sigma = \frac{50}{50} = 1$$

Therefore the actual proportion of persons giving an answer A in the total population from which the sample is taken would be 50 per cent + or − 1 which is somewhere between 49 and 51 per cent and this represents the inherent error of the sample.

ACCURACY OF σ

It has already been said that the proportions of people giving an answer A occurring most frequently are at the peak of the curve represented by p. As the proportions move away from p they occur less and less frequently, so that the chances of obtaining a value greater or lesser than p decrease as we move away from p. Use is made of this fact in calculating the chances of the real value p in the population being outside the standard error of the sample.

The area between the curve and two uprights shown at any two points gives the fraction of the total number of observations between those two points. In Fig. 9 uprights have been drawn at points corresponding to 1, 2 and 3 times the standard deviation of the distribution on either side of the mean.

The area between $-\sigma$ and $+\sigma$ is 68 per cent of the total area. This means that in a normal distribution 68 per cent of the observations lie within a distance equal to one standard

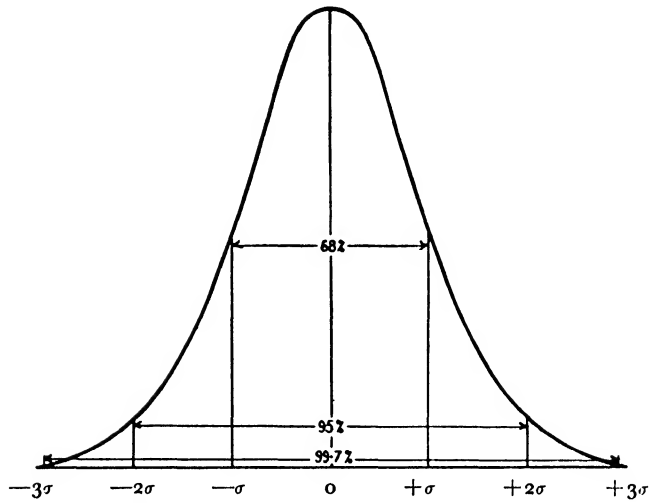


FIG. 9. NORMAL CURVE AND DISPERSION

deviation on either side of the mean. Similarly from -2σ to $+2\sigma$ includes 95 per cent of all observations and from -3σ to $+3\sigma$ includes 99·7 per cent. Hence it is obvious that in a normal distribution practically all the observations lie within a range of six times the standard deviation.

This means that the number of samples giving an error of more than

σ is 32 per cent
2σ is 5 ,, ,,
3σ is ·3 ,, ,,

It is possible to be reasonably certain, therefore, that the real proportion in the population will be within $\pm 3\sigma$ of the proportion actually found in a particular survey. In only three cases out of a thousand will the error be greater than this, which is a small enough chance to be ignored.

If for some reason it is thought that a chance of 1 in 20 is sufficient, the limi of error can be set at 2σ instead of 3σ. This might be the case if there was some reason not arising from the survey itself for supposing that the figure obtained in the

survey was fairly accurate. In most market research surveys it is usual, however, to use three standard deviations, or 3σ.

A problem which immediately springs to mind is how can the error be calculated when there are three or more different answers to a given question? In such a case the error is calculated separately for each individual answer. Supposing the possible answers to be A, B and C, then each answer must be A or something else, B or something else, C or something else.

If these answers were given in the following proportions,

A	40	per cent
B	35	,, ,,
C	25	,, ,,

then for each separate answer the errors would be

$$\textit{For A} \quad \sigma = \sqrt{\frac{40 \times (B + C)}{N}} = \sqrt{\frac{40 \times (35 + 25)}{N}}$$

$$= \sqrt{\frac{40 \times 60}{N}} = \sqrt{\frac{2400}{N}}$$

$$\textit{For B} \quad \sigma = \sqrt{\frac{35 \times (A + C)}{N}} = \sqrt{\frac{35 \times (40 + 25)}{N}}$$

$$= \sqrt{\frac{35 \times 65}{N}} = \sqrt{\frac{2275}{N}}$$

$$\textit{For C} \quad \sigma = \sqrt{\frac{25 \times (A + B)}{N}} = \sqrt{\frac{25 \times (40 + 35)}{N}}$$

$$= \sqrt{\frac{25 \times 75}{N}} = \sqrt{\frac{1875}{N}}$$

As it has already been said, in market research it is usual to use three standard deviations and, therefore, the formula to be remembered is

$$3\sigma = 3\sqrt{\frac{pq}{N}}$$

Chapter VIII

THE SIZE OF THE SAMPLE

In the preceding chapters it has been explained how the error of a sample can be determined, but this can only be determined after the survey has been completed. In other words, the exact standard error of the sample relative to a particular question can only be determined when the answers to that question are available. The reason for this is that it is only then that the number of respondents answering the question in a particular way can be calculated to supply the figures necessary to complete the formula.

It is, however, necessary to know beforehand what size of sample to select if the work is to run smoothly. To change the construction of the sample after the work has begun or has been partly completed can be costly and can also lead to inaccuracies. To have too large a sample in order to be certain of having a sufficiently large one will involve unnecessary expense. How then can the size of the sample be determined in advance?

For any given survey there are two factors which will influence the size of the sample. They are:

1. The degree of accuracy which is required in the results.
2. The breakdown necessitated by the particular survey.

It is often thought that the size of the sample depends on the size of the population or universe; this is not in fact so, and the size of the universe has no bearing on the size of the sample except in so far as a large universe may be more complex than a small one. There are, however, many cases where a small universe is more complex than a large one and consequently requires a larger sample.

DEGREE OF ACCURACY

Sampling is based on the theory of probability, which means that, as already explained in connection with the Law of Statistical Regularity, if a large enough sample is taken of a specified group the sample will probably contain the same characteristics as the group in approximately the same proportions.

A good example of the effect of this theory is to be found in the tossing of a coin. If a coin is tossed it must turn up either heads or tails, there is no other possibility. If the coin is tossed twice there are three possible combinations; two heads; two tails; or one head and one tail. Obviously the more a coin is tossed the greater the possible number of combinations, but if a coin is tossed a great number of times it will be found that a pattern will begin to emerge.

If a coin is tossed 100 times, it will be found that the number of heads and tails will tend towards 50 per cent each. The difference may be 60 to 40, or 51 to 49, but the tendency will be there. If the results of several samples of 100 tosses are combined the tendency will become even more pronounced. The following table gives the results of five samples of 100 tosses:

	Heads	*Tails*	*Difference*	*Error*
1st hundred tosses . .	46	54	− 8	4%
2nd ,, ,, . .	58	42	+16	8%
3rd ,, ,, . .	54	46	+ 8	4%
4th ,, ,, . .	47	53	− 6	3%
5th ,, ,, . .	48	52	− 4	2%
Totals . .	253	247	6	0.6%

TABLE III. RESULTS OF TOSSING A COIN

From this table it will be seen that the difference varies between 4 and 16 and the error varies from 2 to 8 per cent. It is, however, important to note that it is not always in the same direction; sometimes it is plus and sometimes minus. Now if the results of the five samples are combined, the error is only 0·6 per cent and the results are respectively 50·6 per cent heads and 49·4 per cent tails.

The reason for the greater accuracy in larger samples is

simply that errors one way in some of the smaller samples tend to be cancelled out by errors the other way in the other smaller samples. As the size of the sample increases, therefore, so the error decreases.

Now the error has nothing to do with the universe, because it is the error of a particular sample. For example, if we consider the sample of 500 tosses of a coin as a sample in a possible 5,000 tosses, the error is 0·6 per cent and we can say that in 5,000 tosses the results will be 50·6 per cent heads and 49·4 per cent tails + or − 0·6 per cent. But supposing we consider the 500 tosses to be a sample of 500,000 possible tosses, what then? The answer is again 50·6 per cent heads and 49·4 per cent tails + or − 0·6 per cent.

The difference in the size of the universe will only become apparent if it is necessary to work out actual figures, thus in the respective universes of 5,000 and 500,000 the figure would be:

	Heads	*Tails*	*Differences*
5,000	2,530	2,470	30 (0·6 per cent)
500,000	253,000	247,000	3,000 (0·6 per cent)

In each case the percentage of difference is the same.

To determine beforehand what will be the probable error of the sample is comparatively simple. The formula $\sigma = \sqrt{\frac{pq}{N}}$ will give the standard error of a sample where p, q and N are known. If, however, the values of σ, p and q can be determined, then it is possible to determine N, the size of the sample.

To determine σ, it is only necessary to decide what degree of accuracy is required. In market research it is seldom that a very high degree of accuracy is necessary and an error of 5 per cent either way is usually the lowest that is expected.

To determine p and q with any degree of accuracy it must be known in advance what will be the likely proportions of people answering a question in a particular manner. This can very often be determined from available statistics or a knowledge of the market. In questions of brand preference,

for example, it is usually known what proportions of respondents prefer certain brands. If, however, it is not possible to determine p and q, then the worst case can be assumed, which is, as has already been said, 50 and 50.

Since in market research it is usual to use three standard deviations, the appropriate formula will be: $3\sigma = 3\sqrt{\frac{pq}{N}}$. To find N (the size of the sample) it is necessary to have a formula where N is the unknown. This can be obtained from the above formula by ordinary algebraic process. For the non-mathematical reader the steps are as follows.

(1)	$3\sigma = 3\sqrt{\frac{pq}{N}}$	The original formula.
(2)	$(3\sigma)^2 = \frac{9(pq)}{N}$	By squaring both sides.
(3)	$\frac{(3\sigma)^2}{(3\sigma)^2} = \frac{9(pq)}{N(3\sigma)^2}$	By dividing both sides by $(3\sigma)^2$.
(4)	$1 = \frac{9(pq)}{N(3\sigma)^2}$	By simplification.
(5)	$N = \frac{9(pq)N}{N(3\sigma)^2}$	By multiplying both sides by N.
(6)	$N = \frac{9(pq)}{(3\sigma)^2}$	By simplification.

Thus in the new formula $N = \frac{9(pq)}{(3\sigma)^2}$, N is the unknown quantity and can be found by substituting appropriate numbers for p, q and (3σ).

Supposing that it has been decided that an error of 10 per cent is permissible and that the worst case as regards p and q is assumed, the appropriate numbers will be:

$$(3\sigma) = 10$$
$$p = 50$$
$$q = 50,$$

and by substituting in the formula,

$$N = \frac{9(50 \times 50)}{(10)^2}$$

Size of sample using $\frac{9(pq)}{(3\sigma)^2}$

Limits $\pm 3\sigma$ (in %)	1 99	2 98	3 97	4 96	5 95	10 90	15 85
0.1	89,100	176,400	261,900	345,600	427,500	810,000	1,147,500
0.2	22,275	44,100	65,475	86,400	106,875	202,500	286,875
0.3	9,900	19,600	29,100	38,400	47,500	90,000	127,500
0 4	5,569	11,025	16,369	21,600	26,719	50,625	71,719
0 5	3,564	7,056	10,476	13,824	17,100	32,400	45,900
0 6	2,475	4,900	7,275	9,600	11,875	22,500	31,875
0 7	1,818	3,600	5,345	7,053	8,724	16,531	23,418
0.8	1,392	2,756	4,092	5,400	6,680	12,656	17,930
0.9	1,100	2,178	3,233	4,267	5,278	10,000	14,167
1.0	891	1,764	2,619	3,456	4,275	8,100	11,475
1.5	396	784	1,164	1,536	1,900	3,600	5,100
2 0	223	441	655	864	1,069	2,025	2,869
2 5	143	282	419	553	684	1,296	1,836
3 0	99	196	291	384	475	900	1,275
3 5	73	144	214	282	349	661	937
4 0	56	110	164	216	267	506	717
4 5	44	87	129	171	211	400	567
5 0	36	71	105	138	171	324	459
6 0	25	49	73	96	119	225	319
7 0	18	36	53	71	87	165	234
8 0	14	28	41	54	67	127	179
9 0	11	22	32	43	53	100	142
10.0	9	18	26	35	43	81	115
15 0	4	8	12	15	19	36	51
20.0	2	4	7	9	11	20	29
25.0	1	3	4	6	7	13	18
30 0	1	2	3	4	5	9	13
35 0	.7	1	2	3	3	7	9
40 0	.6	1	2	2	3	5	7

TABLE IV

Source: Theodore H. Brown, *The Use of Statistical Techniques*
School, Division of Research, Business Research

$$N = \frac{22500}{100}$$

$$N = 225$$

It can then be said that in a sample of 225 the maximum error will be 10 per cent. This formula can be applied to determine the size of any sample. Tables, of which the following are an example, can be used for ease of reference.

Size of sample using $\frac{9(pq)}{(3\sigma)^2}$

Limits $\pm 3\bar{\sigma}$ (in %)	20 80	25 75	30 70	35 65	40 60	45 55	50 50
0.1	1,440,000	1,687,500	1,890,000	2,047,500	2,160,000	2,227,500	2,250,000
0.2	360,000	421,875	472,500	511,875	540,000	556,875	562,500
0.3	160,000	187,500	210,000	227,500	240,000	247,500	250,000
0.4	90,000	105,469	118,125	127,969	135,000	139,219	140,625
0.5	57,600	67,500	75,600	81,900	86,400	89,100	90,000
0.6	40,000	46,875	52,500	56,875	60,000	61,875	62,500
0.7	29,388	34,439	38,571	41,786	44,082	45,459	45,918
0.8	22,500	26,367	29,531	31,992	33,750	34,805	35,156
0.9	17,778	20,833	23,333	25,278	26,667	27,500	27,778
1.0	14,400	16,875	18,900	20,475	21,600	22,275	22,500
1.5	6,400	7,500	8,400	9,100	9,600	9,900	10,000
2.0	3,600	4,219	4,725	5,119	5,400	5,569	5,625
2.5	2,304	2,700	3,024	3,276	3,456	3,564	3,600
3.0	1,600	1,875	2,100	2,275	2,400	2,475	2,500
3.5	1,176	1,378	1,543	1,671	1,763	1,818	1,837
4.0	900	1,055	1,181	1,280	1,350	1,392	1,406
4.5	711	833	933	1,011	1,067	1,100	1,111
5.0	576	675	756	819	864	891	900
6.0	400	469	525	569	600	619	625
7.0	294	344	386	418	441	455	459
8.0	225	264	295	320	338	348	352
9.0	178	208	233	253	267	275	278
10.0	144	169	189	205	216	223	225
15.0	64	75	84	91	96	99	100
20.0	36	42	47	51	54	56	56
25.0	23	27	30	33	35	36	36
30.0	16	19	21	23	24	25	25
35.0	12	14	15	17	18	18	18
40.0	9	11	12	13	14	14	14

TABLE V

in Certain Problems of Market Research (Harvard Business Studies, No. 12) pp. 12-13.

Consider now the formula $\sigma = \frac{50 \times 50}{2500}$. It will be seen that $\sigma = 1$. If 3 σ are used, as is normal in market research, it can be said that, assuming the worst case for p and q, a sample of 2,500 will give a probable error of 3 per cent. Thus, whenever the numerator and denominator are equal the error will be 3 per cent thus in $\sigma = \frac{10 \times 90}{900}$, using 3σ, the error will still be 3 per cent.

From this it will be seen that, allowing for an error of 3 per cent, it is only necessary to multiply p and q to know the size of the sample. This is, of course, invaluable in working out the necessary sample size quickly as may be required at a conference. If the error is doubled, where 6 per cent would be permissible, the sample is divided by 4. If the error is reduced by half, to 1½ per cent, the sample is multiplied by 4.

Thus:

for 3 per cent error the sample is 2,500 where p and $q = 50$ each.

„ 6 „ „ „ „ „ „ $\frac{2,500}{4} = 625$.

„ 1½ „ „ „ „ „ „ 2,500 × 4 = 10,000.

Similarly, by whatever factor the error is divided or multiplied, the sample is multiplied or divided inversely with the error, by a factor corresponding to the square of the factor by which the error is multiplied or divided.

BREAKDOWN OF THE SAMPLE

A sample may be broken down in two ways according to the requirements of the survey:

1. By questions in the questionnaire.
2. By population characteristics.

This is the second factor which governs the size of the sample, and it is important to note that the more complex the breakdown the larger will be the sample.

In building up a sample each question must be considered separately. It is likely that every question in a questionnaire will have a different response, so that the standard error will be different for each question. Questions will also be broken down into sub-questions, the error for each of which will again be different.

For example, supposing two questions in a questionnaire read as follows:

Q. 1. Do you own a car?

(If answer "yes" ask Q. 2. If "no" skip to Q. 10.)

Q. 2. What brand of car do you own?

Brand A. ———— ☐

,, B. ———— ☐

,, C. ———— ☐

,, D. ———— ☐

other ———— ☐

As soon as Q. 1 is answered, the sample will be considerably reduced. Supposing the sample was originally 625, giving a maximum error of 6 per cent for any one question, then the answers to Q. 1 will be accurate to within 6 per cent or less.

If the answers to Q. 1 are 25 per cent "yes" and 75 per cent "no", the error would be less than 5 per cent, which is good enough for that question, but we should be left with only 156 respondents to answer Q. 2, and if the 156 is further broken down among the four possible answers it is obvious that the sample will be inadequate.

To build up the sample it would be necessary to begin with the sub-question. It would be known in approximately what

proportion various brands of cars are owned; the figures might be

A. 15 per cent
B. 10 ,, ,,
C. 30 ,, ,,
D. 5 ,, ,,

leaving 40 per cent who own other brands. Now the worst case in Q. 2 is 40 per cent who own other brands, and this can be taken as a basis since the answers to the other questions will involve a smaller error.

To give an error of 6 per cent where p and q are 40 and 60, a sample of 600 is required, so that it is necessary to have at least 600 respondents remaining to answer Q. 2 after Q. 1 has been answered. As regards Q. 1 it would again be known what proportion of the population owned cars, and if the ratio were 1 to 5, in order to have a sample of 600 to answer Q. 2 it would be necessary to interview a minimum of 3,000 for Q. 1.

It will be seen that the size of the sample will depend very much on the complexity of the questionnaire. Every question will need to be carefully examined with its sub-questions and in relation to its dependence on previous questions. If the more simple combinations are eliminated and the total sample based on the most complex combination a total sample will result which will be equally adequate for the more simple combinations.

A further factor to be considered is the complexity of the market. If, for example, answers are required to be broken down according to professional occupation, income group, sex or some other factor, the sample in Q. 2 must be increased to allow for this breakdown and consequently the sample for Q. 1 will also be increased.

Of course, the same degree of accuracy will not be required for every question and some questions will receive a greater degree of accuracy than is necessary, due inevitably to the size of the sample required for other questions. Again the respondents are the same for all questions, so that it is only necessary to have a sample large enough to cater for the most

complex combination, and for the greatest degree of accuracy required in any one question to have a sample adequate for the whole questionnaire.

In general, to determine the size of a sample from the questionnaire involves the following four steps:

1. Determine the degree of accuracy required for each individual question and sub-questions.
2. On the basis of experience and from available records, determine what proportions of respondents are likely to give different answers to individual questions. Where this cannot be determined, assume the worst case, as already explained.
3. By using the formula, determine the sample required for each question and sub-question.
4. Select the largest sample required and verify that it caters adequately for all other questions. If it does not, then further additions will be necessary according to the requirements of those questions for which it does not cater.

A technique which is very useful in reducing the size of a sample without reducing the degree of accuracy is the technique of weighting. This is an important technique and is fully explained in the next chapter.

Chapter IX

WEIGHTING A SAMPLE

Before going into the technique of weighting a sample, it is first necessary to explain a procedure which is fundamentally the same, that is the *weighted average.* Every statistician and research worker uses the weighted average frequently, and it is also frequently used in business, though it may not be known to the user by its correct name.

THE WEIGHTED AVERAGE

The ordinary arithmetic mean has already been explained at some length and the weighted average is merely a variation of the arithmetic mean.

The principle involved is that every factor which goes to make up the average must bear its correct importance, otherwise the result will be distorted. It frequently happens that before an average can be taken of given data their values have to be "doctored" to bring them into a correct relationship with each other.

A good example is to be found in sales forecasting. Assuming a company sells in four territories A, B, C and D, and has established its sales forecast for the next year on the basis of statistics and information supplied by its own observations and market research. This forecast might be as follows:

Territory A + 24 per cent.
,, B − 10 ,, ,,
,, C + 6 ,, ,,
,, D no change

On the basis of an ordinary arithmetic mean it might be established that their overall forecast will be as follows:

$$\frac{24 - 10 + 6 + 0}{4} = +5 \text{ per cent.}$$

It would therefore appear that an overall increase in sales of 5 per cent can be expected.

It would, however, be erroneous to make such an assumption, because some territories are poorer than others, or for some other reason may not be such good markets. In this way the importance of different territories may well vary from a sales point of view.

Supposing sales in the four territories were as follows:

A £50,000
B £450,000
C £150,000
D £350,000

Total £1,000,000

We could construct the following table

Territory	Total sales	x Percentage of total sales	y Change forecast	xy Weighted forecast
A	£50,000	5	+24	+120
B	£450,000	45	−10	−450
C	£150,000	15	+ 6	+ 90
D	£350,000	35	0	0
	£1,000,000	100		−240

TABLE VI. WEIGHTED FORECAST

Using the figures in column x as *weighting factors*, we obtain a weighted forecast of $-\frac{240}{100} = -2{\cdot}4$ per cent, which is the correct change for the four territories combined.

$-2{\cdot}4$ tells a very different story from the $+5$ calculated by using the ordinary arithmetic mean.

WEIGHTING A SAMPLE

In weighting a sample, exactly the same principle is used. Most samples, which require a breakdown or which are stratified according to known characteristics of the universe from which they are taken, are weighted to some extent. It almost invariably happens with such samples that the sub-samples representing one or two particular groups of the entire universe are so small that it is quite impossible to obtain any statistical analysis from them, much less obtain the degree of accuracy which may be required in respect of these sub-samples.

One way of overcoming this difficulty would be to increase the sub-samples in proportion. If this method were adopted it would result in a sample of such size that the cost of the survey would be prohibitive, quite apart from the waste of effort which would result from using sub-samples four or five times as large as they need be for those groups which would already be adequately represented.

Let us consider a sample which has to be stratified by income level.

The following table,[1] reproduced from the Hulton Readership Survey, gives a basis for selection that is widely used. It must, however, be emphasised that the strict income basis is never used by itself as a basis for selection, but is only one of the criteria. The division into social classes is essentially a family one, in which the most important criterion for

[1] This method of dividing the population into socio-economic groups based on income and status must to some extent be artificial under present conditions. To say that a man earning £1,000 a year is well-to-do is questionable; can he even be considered on the same purchasing level as the man earning £2,500. With heavy taxation and redistribution of income, there has occurred a widespread levelling of purchasing power and things that are bought by the workman are often out of the reach of the professional man.

Such divisions do, however, provide some basis from which to work, and the one shown here is as good as any. It may be that when conditions settle down to a new normal, this system will regain its pre-war value, or it may be that market research practitioners should seek a new method of classifying population groups that is more in keeping with present conditions. Any book on market research would, however, be incomplete without a proper treatment of a much-used method and for this reason it has been included here. In practice, however, it must be used with circumspection.

Class	Description	Brief definition	Percentage of households in each class.	Usual income level of head of household.
A	Well-to-do	Heads of households are successful business or professional men, or senior civil servants, or having considerable private means.	3½ per cent	Over £1,000 a year.
B	The middle class.	Heads of households in younger age groups, will probably graduate later to Class A; those in older groups occupy the less senior positions in business and the professions, or the middle grades of the Civil Service.	7½ per cent	£650 to £1,000 a year.
C	The lower middle class.	The families of the more highly-skilled workers, small trades-people, and black-coated workers in the more important clerical grades.	17 per cent	£400 to £649 a year.
D	The working class.	The families of the great bulk of manual workers and of clerical workers in the less responsible positions.	63 per cent	£225 to £399 a year.
E	The poor.	Pensioners, widows with families, and those who, through periods of sickness or unemployment, or lack of opportunity, are unable to reach the higher grades.	9 per cent	Under £225 a year.

(Acknowledgement to Hulton Press Limited—Table reproduced from the *Hulton Readership Survey*, 1948.)

TABLE VII. INCOME GROUPS

classification is the social status of the head of the household. Incomes are used in combination with status and are more useful as pointers than as a basis for grading; they are the sort of income that might be expected in each case.

Another point that it is important to realise is that the table shown is based on the total population of the United Kingdom and as such is not applicable to surveys that are limited to a specific geographical area. In such cases the *local* breakdown of the population must first be ascertained.

Supposing that for the proposed survey it is only desired to stratify the sample according to income groups and that this is the only breakdown required in the analysis. It has also been decided that it is essential to obtain results which are accurate to at least 5 per cent in respect of the main question round which the survey centres.

From statistical information and other sources it has been carefully worked out that the level of respondents giving an affirmative answer to the main question is likely to be as follows:

Class			
A	20	per	cent
B	20	,,	,,
C	25	,,	,,
D	35	,,	,,
E	15	,,	,,

We cannot, of course, be certain that these percentages are accurate until the survey has been completed, and it would be as well to allow for contingencies by increasing these percentages by 10. The effect of this will be to increase the sample slightly, thus allowing for a variation of 10 per cent.

On this basis we then assume that the proportion (p) of affirmative answers will be

A	20	+ 10	=	30	per	cent
B	20	+ 10	=	30	,,	,,
C	25	+ 10	=	35	,,	,,
D	35	+ 10	=	45	,,	,,
E	15	+ 10	=	25	,,	,,

As the results must be accurate to within 5 per cent, by using the formula allowing three standard deviations we should have

$N = \frac{9(pq)}{(3 \times 5)^2}$, and if the sample is worked out for each class we obtain the following:

Class	*Size of Sample required*
A	756
B	756
C	819
D	891
E	675
Giving a total sample of	3,897 interviews.

But our table of income levels shows that these figures are in no way related to the actual distribution of income in the country. We cannot decrease the sample for Class A, so that we should have to increase all other samples proportionately. If we did this we should have a total sample so large that it would be impossible to carry out the survey economically.

If, however, we bear in mind that the actual samples are out of proportion and that the results will need adjustment we can avoid too large a sample by weighting the results.

Supposing the results are as follows:[1]

No. of respondents answering Yes.	Class A	165	22	per cent
	B	179	23·5	,, ,,
	C	246	30	,, ,,
	D	278	31	,, ,,
	E	115	17	,, ,,

Here we have different percentages for each group, which, although they can be used as they are to indicate the response

[1] Figures are accurate to the nearest 0·5 per cent.

of each separate group, cannot be combined to show the overall response until they have been brought back to their true proportion within the universe.

In the case of group A we have used a sample of 756 instead of 136·4 (which is 3½ per cent of 3,897). By simple proportion we can determine what would have been the number of respondents giving an affirmative answer in a sample of 136·4.

This would be $\frac{165}{756} = \frac{x}{136{\cdot}4}$

$$756x = 165 \times 136{\cdot}4$$
$$x = 29{\cdot}75, \text{ which is 22 per cent of } 136{\cdot}4$$

By working out the number of affirmative responses for the correct proportions of each group we could obtain a figure which would give the total number of yes answers had the sample been properly stratified. However, there are much simpler ways of doing this, by using weighting factors.

If we build a table similar to that demonstrated in the case of the sales forecast we should have the following:

Class	*Weighting factor*	*y* *Percentage of response*	*x y* *Weighted response*
A	3·5	22	77
B	7·5	23·5	176·25
C	17	30	510
D	63	31	1953
E	9	17	153
	100·0		2869·25
			$\frac{2869}{100}$ = 28·69 per cent.

TABLE VIII. WEIGHTED RESULTS

Note in this case the weighting factors always total 100. If we wish to find out what is the percentage of the total represented by each class, we should have the following table:

Class	*Weighting factor*	*y* *Percentage of response*	*xy* *Weighted response*
A	·035	22	·77
B	·075	23·5	1·76
C	·17	30	5·1
D	·63	31	19·53
E	·09	17	1·53
	1·00		*Total* = 28·69

TABLE IX. WEIGHTED RESULTS

In practice, however, it is not always necessary to adopt this method and much simpler ways of weighting the sample can be used. Of course, the method used will depend on the particular problems of individual cases.

A minor disadvantage of the *Hulton Readership Survey* of 1947 was that certain sub-samples were too small to provide results which could be used without reservation. This applied particularly to sub-samples drawn from the upper social groups, which are of considerable importance from a marketing point of view.

It was therefore decided that, for the 1948 and subsequent editions, the sub-samples must be increased. This could have been done by doubling the total sample, but since the doubling of Classes D & E would have considerably increased the time and resources required for the field work, without adding very much to the reliability of the figures for these classes or for the sample as a whole, this was found unnecessary. The method adopted was to double the sample for Classes A, B, and C, and only add half the results from these samples into the total. This produced a situation in which figures for Classes A, B, and C by themselves were based on more reliable sub-samples, but in which the figures for the total sample were correct, because the proportion of individual classes making it up were kept down to their true ratios.

The theoretical procedure in a case of this nature is to divide by two all results for the over-weighted classes before adding them to the other classes to make a total. In practice, when

punched card machinery is being used for tabulation, it is more convenient to double the figures for the unweighted classes and to produce a total by adding together the *actual* results of the double-weighted sub-samples and the *doubled* results of the true-weighted sub-samples. The following table[1] is an example of this:

	MEN								
	HOUSEHOLDERS			OTHERS			ALL MEN		
	Actual	*Weighted*		*Actual*	*Weighted*		*Actual*	*Weighted*	
	No.	*No.*	*Per cent*	*No.*	*No.*	*Per cent*	*No.*	*No.*	*Per cent*
A	257	257	4·0	72	72	2·6	329	329	3·6
B	514	514	8·1	166	166	6·0	680	680	7·5
C	1,148	1,148	18·0	419	419	15·3	1,567	1,567	17·2
D	2,023	4,046	63·5	869	1,738	63·3	2,892	5,784	63·4
E	204	408	6·4	176	352	12·8	380	760	8·3
All Classes	4,146	6,373	100·0	1,702	2,747	100·0	5,848	9,120	100·0

TABLE X. PART BREAKDOWN OF THE HULTON SAMPLE

The result is exactly the same as if the theoretical procedure had been followed, but this procedure is technically more convenient.

All calculations have been made on the basis of the weighted figures, which ensures that the sample used is a completely representative one.

[1] This explanation of the weighting procedure used in this survey and the table are reproduced by permission of Hulton Press Limited.

Chapter X

SELECTING THE SAMPLE

THE SELECTION of the sample or, in other words, the planning of the cross-section of the population which is going to be the sample for a particular survey, is one of the most important steps in survey work, because it is in this operation that there is the greatest danger of introducing a bias before the collection of information even starts. Obviously, if selection is done haphazardly and greater attention is given to convenience rather than care or the need for accuracy, the sample will quite likely be weighted towards one or more factors and the results would be distorted. If for example a survey were conducted solely in an area inhabited by the lower income groups because it was convenient, the sample would consist entirely of lower-income-group households and the results would give no indication of the habits and attitudes of the middle- and higher-income-group households.

It is therefore essential that the sample should be truly representative of the population; in other words, it should be a complete miniature of that population and should contain the same characteristics in the same proportions. Since, however, a sample is only a miniature, it can never be an exact representation, or if by chance it were, the fact that it was would not be known. It is only by carrying out a complete census that absolutely exact figures could be obtained, and even then this would be doubtful, because of the time necessary to complete a census and the possibility of changes occurring in the meantime.

The value of sampling as opposed to carrying out a complete census lies in the facts that it is much cheaper and the results are available in a very much shorter time. The cost of a complete census would be prohibitive to any business concern

and the results would not be available for years; its only possible advantage would be the questionable one of eliminating the inherent error of the sample, which is small enough in any case to make little difference for most business purposes and which can in any case be accurately determined.

In selecting the sample, there are certain fundamental requirements upon which will depend not only the actual method of selection adopted for a particular survey, but also the accuracy of the results obtained. Before, therefore, the actual methods of selection are discussed the following essential criteria must be noted:

1. A sample should be an accurate representation of the universe (or population) from which it is taken, and should possess all the characteristics of that universe in their correct proportions.
2. A sample should not only be designed to produce the actual information required by the study but must also provide an adequate basis for the measurement of its own reliability.
3. A sample should be of sufficient size to give the degree of accuracy required by the particular study, but should also not be larger than is necessary.
4. A sample should be large enough to provide sub-samples of a size adequate for the proper analysis of subsidiary problems.
5. Sub-samples must be catered for according to the requirements of specific questions and must be of the size required to give the degree of accuracy necessary for these questions.

THE UNIVERSE

In selecting a sample, the first step is to define the "universe" for the particular study. In market research the term "universe" is applied to the total population a particular survey is designed to study. For example, in a nation-wide survey for a household product used by every section of the community, the universe in the case of England would consist of

every household in the country. If the product were an electrical appliance, there would be immediately a factor which would limit the universe to all those households which were electrically wired, or about to be in the near future.

On the other hand, if the product is a motor-car accessory, the universe would consist of all motor-car owners. Again if the product is a television set, the universe would consist of all households whose income enabled them to purchase a television set, situated within receiving distance of a transmitter and whose houses were connected to an electric mains. From this it will be obvious that the universe for any particular purpose can be limited by several factors, and, although in every case a survey *could* be conducted purely at random and taking in the entire population of the country, in most cases such a procedure would require an enormous sample to make sure that a sufficient number of the people in which the survey was really interested were included. The others would not make any useful contribution to the results, thus resulting in a sheer waste of money in surveying them.

The universe may also be limited geographically. In some cases surveys may be designed to obtain specific information about a particular area. In such cases the universe would be limited to people possessing the attributes which would bring them within the universe for the study in question and also living in the area concerned. Obviously, here again, to interview people who were in no way concerned with the area in question would add nothing useful to the results and would merely involve extra cost.

Thus every survey will have its own particular universe; it may not be possible always to eliminate everyone who does not come within the universe, because the factors which limit the universe may not be fully known. And there is also the danger that a factor which may be thought to limit the universe may not in actual fact do so. This might well be in the case of television sets. Although television sets are expensive and on the face of it limited to households enjoying a certain level of income, hire-purchase facilities may well bring it within the

reach of lower income groups. Extra earnings by sons and daughters or accumulated savings may also have this effect.

METHODS OF SELECTION

Modern market-research technique recognises three methods of selecting the sample. These are:

1. The random sample.
2. The area sample.
3. The quota sample.

The method of selection for any particular study will depend on the nature of the survey and to some extent on the universe with which it is concerned. The factors which govern the selection will be mentioned after each method has been described.

THE RANDOM SAMPLE

It is important to note that random selection does *not* mean *haphazard* selection. In market research a random sample is one in which every item in the universe has an equal chance with all other items of being selected. Once the universe has been defined it is necessary to obtain a complete list of the universe and select "at random" from that list. The normal procedure would be to select every *n*th name, or that which appears opposite every *n*th inch of a ruler placed against the list of names.

The difficulty in random sampling lies in obtaining the necessary list of the universe, and quite frankly this is usually impossible except in cases where the universe is relatively small and well defined. Examples of such cases would be where the universe consists of all motor-car owners, telephone subscribers, certain professions and in every case where the characteristics of the universe would make the existence of a complete list automatic.

In most of these cases the fact that their names are on the list is usually the only available known characteristic. The telephone directory, for example, gives the names of all telephone

users, but there is simply no means of knowing what are their other characteristics. For this reason a random sample would be the only possible one in such a case.

It is seldom possible to conduct the survey by personal interview where a random sample has been selected unless the universe is fairly limited and the area concerned is fairly small. This method of selection is more useful when applied to telephone or mail enquiries. The fact that personal interviewing can be seldom used is probably the greatest disadvantage of this method.

It will be readily understood that where the universe is large and widely scattered, the expense of covering wide areas and sometimes travelling great distances to interview single respondents would be prohibitive. Supposing that in a survey for a household product a random sample were selected on the basis of every *n*th name on the electoral register. Some respondents would be situated in towns, others in inaccessible country districts. Obviously while this would offer no disadvantage in a survey conducted by post, to do the survey by personal interview would be a long, tedious and extremely expensive undertaking.

In spite of its practical disadvantages, the random sample is statistically ideal, and it can be applied in many surveys of a more specialised nature.

THE AREA SAMPLE

The area sample has its origin in agriculture. To estimate the crop yield of a given area, the area is split up into blocks and a sample of blocks is selected at random. The blocks are then analysed and their crop yield estimated. From the estimates of the sample the yield of the whole area is projected.

This method gives very accurate estimates and has now been applied to sampling in market research and public-opinion polling. This is in principle random selection with the difference that, instead of selecting people at random, blocks of people are selected and within those blocks the people themselves. The procedure is first of all to define the universe. The

geographical area is then split into blocks or sub-areas each of a similar pattern and of approximately the same size. From the blocks themselves individuals are selected as respondents in the survey.

This procedure has basically the same effect as a random sample, because the blocks are selected purely at random, and respondents within the blocks are also selected at random. This means that every item in the universe has the same chance of selection as any other.

In selecting the sample, where the method of area sampling is being used, there are basically four steps.

1. The definition of the universe according to the principles already described.
2. The definition of the geographical area to be considered.
3. The decision as to the pattern and size of the blocks within that area.
4. The selection of items (individual respondents or households) to be interviewed within the blocks.

Defining the Universe

The definition of the universe will depend on the nature of the problem. As already explained, the universe may be limited by certain factors and the procedure for defining the universe in area sampling is identical with that which is generally applicable to all survey work in market research.

Defining the Geographical Area

This step will usually indicate whether or not the method of area sampling is suitable for a particular survey. It will be readily understood that if blocks are to be thrown together and then selected at random, they must be comparable both as to size and density of population. They must also be of broadly similar pattern. Obviously, where the survey involves both urban and rural areas, these criteria may not be obtainable and the method of area sampling would be unsuitable unless this distinction is taken into account.

On the other hand, as so often happens, a survey may be concerned only with a limited area, which it is desired to study. If this area is more or less homogeneous so that it can be broken up into equal and similar blocks, the method of area sampling would be appropriate. Surveys in towns, and particularly large towns such as London, could well be conducted by this method.

Deciding the Primary Sampling Unit or Block

The size and pattern of the block or primary sampling unit will depend to a large extent on the nature of the survey and of the universe to be sampled. Obviously a survey in an urban area would require much smaller blocks than one in a country area, because of the greater density of population. The important principle is that every block should be equal in size and similar in pattern so that the sample will be similar whatever blocks are selected.

Having then decided on the primary unit and divided the whole area into such units, it remains to select a sample of these units at random. This can be done simply by numbering all units in sequence and selecting every *n*th unit. Thus, if 5 per cent of the units were required to make up the sample, every twentieth, fortieth, sixtieth, etc., unit would be selected.

The Selection of Items Within Primary Units

This is a process common to all methods of sampling and consists simply of selecting the actual respondents it is proposed to interview. These may consist of individuals, households, dealers, etc., according to the needs of the survey. Although it would be possible to interview every respondent within a given block, it is more usual to sample the blocks, or primary units, mainly because of the factors of cost and time.

This procedure is termed sub-sampling, because it consists of taking a sample from within units which themselves form part of an earlier sample. Lists of respondents can be compiled from existing lists, such as voting registers or by sending out interviewers to note the streets and houses in the block and then building up lists from this data. Once the lists are compiled for

each block, a random selection is made from these lists and interviewing is started.

Further Points in Area Sampling

The first important fact concerning area sampling is that this method does give an entirely random sample. Care must, however, be taken to ensure that in the primary sample of blocks every item is comparable, that they are equal as regards the population they contain and similar in pattern, i.e. contain similar proportions of different types of people.

The accuracy and reliability of the sample can be increased by increasing the number of primary units. If this is done the units will be smaller and individually less important with a greater chance of errors in one being cancelled out by errors in the opposite direction in others. If it were decided, for example, to use three large primary units out of a total of fifty for a particular survey, any strong bias existing in one unit would probably be reflected in the final results. On the other hand, if a sample of a hundred primary units were selected from a total of five hundred, a strong bias in one unit might be quite unimportant in the final results.

Increasing the number of primary units in the sample would normally mean decreasing the number of interviews in each unit; this would also bring about an increase in costs because of the extra travelling involved. If, however, the whole area is fairly compact and uniform, this may be relatively unimportant. Reliability of the sample would, on the other hand, be increased.

The cost of the preparatory work in area sampling is relatively high for a single survey, but the important fact is that the same preparatory work can be used for a number of surveys, thus spreading the cost over them all. In the research department of a business concern, or in a market research agency, there will normally be maps of various areas already divided into primary units. Each unit will be accompanied by a list of the items in it analysed into their various categories so that the pattern can be readily ascertained. In such cases building a sample would merely involve the selection of primary units

followed by the selection of respondents and would require a comparatively short time.

In area sampling, once the sample has been constructed and the list of interviews compiled, it is essential to obtain the predetermined interviews. This may mean calling back a number of times before the respondent is at home, and every call back means that the survey becomes more expensive. To ignore respondents who are not at home at the first call and replace them by other names, would defeat the whole purpose of random sampling since the sample would no longer be a random one and bias might be introduced by the very fact of not interviewing people who are not at home at a certain time. This may indeed be a characteristic of a certain section of the population.

THE QUOTA SAMPLE

The quota sample, or stratified sample, is one which is controlled according to certain known characteristics of the universe it represents. This means that where the total population or universe is known to possess certain characteristics, the sample can be selected so that it reproduces these characteristics in the same proportions as they are present in the universe.

For example, where the income characteristics or the age make-up of the universe is known it is a relatively simple matter to build up a sample where the income groups or age groups are represented in the same way as they are in the universe. All that is required is that these characteristics should be known in advance. Information from which they can be obtained is usually available in official and other statistics or as a result of previous surveys or surveys conducted specially for this purpose.

Whether or not the method of quota sampling can be used depends on the extent to which the characteristics according to which the sample is to be controlled are known. It is necessary to have available accurate information on this score to avoid introducing a bias, as would occur if the sample were controlled according to characteristics which were inacccurately known. This is, however, the most widely used method today.

The steps to be followed in building up a quota sample are as follows:

1. First of all, as with any other form of sampling, it is necessary to define the universe.
2. Deciding what characteristics of the universe are likely to influence the results.
3. Analysis of available data to determine how these characteristics are distributed in the universe.
4. Selecting the factors which should be controlled.
5. Fixing quotas according to the factors it has been decided to control.
6. Deciding whether weighting is to be used and determining the necessary weights.

Defining the Universe

Here the procedure is the same as for other methods of sampling. The universe or population to be sampled is decided according to the requirements of the survey. It may be that the survey is interested in the users of a certain product; the members of a particular profession, a particular sex or age group, or simply all housewives or households.

In addition to limiting the universe according to certain factors it must also be limited geographically. Ultimately a survey could study the entire population of the world, but this would be impracticable and if it were ever needed would consist of a series of surveys each limited to a specific area. Usually a survey will be limited to a specified geographical area, and it is only when the precise problem the survey sets out to solve is known that the area can be decided.

It is important here to note that the factors which limit the universe are not the same as those by which the sample is to be controlled. Those factors which limit the universe are simply those which, if ignored, would result in increasing the universe and consequently the sample to no particular purpose. It can be readily understood that a survey to ascertain motorists' preference for certain brands of lubricating oil would not take in persons who did not possess a car. If the universe were not

limited by this factor, the sample would have to start by asking the respondent if he had a car, and those who had not would not be questioned further, thus the effective sample would consist of car owners. Obviously such a procedure would result in wasted effort and money, and limiting the universe by the factor of car ownership from the start would be more effective and more economical.

Characteristics Likely to Effect Results

Any population or group of people possess certain definable characteristics. Some of these characteristics will be known beforehand, and in quota sampling it is important to ascertain these characteristics and to decide whether they are likely to affect the results of the survey. These characteristics vary considerably according to the universe being sampled. It will be remembered that where the universe consisted of all telephone subscribers no characteristics were known except that of telephone ownership, which was a factor to limit the universe and not a factor by which the universe, once limited, could be stratified. Accordingly, random sampling had to be used.

Generally the following will be found to be characteristics, by some of which a great number of samples can be stratified:

Income levels—The division of populations into their respective income groups can be accurately ascertained from available statistics.

Age and sex—These two separate characteristics are easily determined in most countries.

Race and colour—These characteristics, while of little importance in European countries, may become major factors in other markets.

Possession of a particular commodity—This might be an important factor in surveys, the results of which may be affected by the actions resulting from the possession of a particular commodity.

Rural and urban residence—People's habits often vary according to where they live, and it may be of importance to ascertain the effect of the locality in which they live.

These general kinds of characteristics which are usually obtainable from official sources are factors which can be used for stratification where the universe is not limited by other characteristics as already pointed out in the case of telephone subscribers. On the other hand, however, in other cases of limited universes, other factors exist by which the sample can be stratified. For example, in a survey conducted among professional men only, the sample could be stratified according to the exact profession, doctor, lawyer, etc.

Analysis of Data

To know how to stratify a sample according to the characteristics of the universe, the incidence of these characteristics in the universe must be known. In other words, if the proportions possessing these characteristics are to be identical in the sample with the actual proportions in the universe, these proportions must be known.

Official statistics are usually the most prolific sources of such information, but also professional bodies, research organisations and other institutions have built up valuable statistics. Most professional market-research agencies will have, over a period of years, accumulated material by which they can easily stratify most samples. It may be that for a major survey it will be worth while to conduct a preliminary survey for the sole purpose of establishing the characteristics of the population.

The analysis of the available data will have the object of giving a quantitative value to the known characteristics. From such an analysis it will be possible to say what proportions of a sample should have the characteristics that it is proposed to use in controlling the sample.

The Factors that Control the Sample

The essential principle of quota sampling is that the sample is controlled by certain factors. Once the various characteristics of the universe have been considered and their incidence measured, those which are suitable in the particular survey are selected as controlling factors.

For example, in a survey for a particular brand of shaving cream, the universe would be limited to men over sixteen. It may, however, be very important to know the reactions of various age groups to the product for the purpose of sales and advertising appeal. In such a case age might be chosen as a controlling factor. It would be necessary to discover the proportions of the whole population over sixteen (the universe) in the various age groups. The sample could then be controlled by ensuring that the correct proportions are represented and this would be done by selecting respondents accordingly.

It is important to note, however, that no factor can be used as a controlling factor unless its existence and its incidence in the universe are known beforehand. The purpose of using controlling factors is to ensure that the sample is representative and at the same time to make it possible to study the reactions of the sample in relation to these factors. By doing so it is possible to avoid accidental weighting of the sample in favour of some particular section of the universe. A factor that is not known or the distribution of which is not known must be left to be brought out in the results.

Fixing the Quotas

The factors that are to be controlled will decide the make-up of the sample, or, in other words, the proportions or quotas of people that are to be selected because they possess the required characteristics. Each interviewer is told what quotas of people possessing given characteristics he or she is to interview. For example, if an interviewer were allocated 100 interviews and the sample was being controlled by the factor of income levels, he would be told that the following quotas were required: Class A, 3–4; B, 7–8; C, 17; D, 63; E, 9.

Fixing quotas is seldom just as easy as that, because it frequently happens that more than one factor is controlled, and if distortion of the results is to be avoided, the inter-relationship of the various controlling factors must be carefully considered when fixing the quotas. The quota requirements are also carefully worked out and tabulated so that the interviewer will have no doubt as to what exactly is required.

For example, assuming that in a particular survey it has been decided to control the sample by two factors: age and income level, and that their distribution in the universe is as follows:

Age	*Percentage*
20–30	26
31–50	53
50 and over	21

Income	*Percentage*
High	10
Medium	70
Low	20

The correct interrelationship of these two factors may be as indicated in the following chart:

Age	*Totals*	*Income Level*		
		High	*Medium*	*Low*
20–30	26	2	18	6
31–50	53	5	46	2
50 and over	21	3	6	12
Totals	100	10	70	20

TABLE XI. CORRECT RELATIONSHIP OF CONTROLLING FACTORS

Now supposing this chart were not given to the interviewer and he were simply told what totals in each category were required, the following distribution of interviews might result:

Age	*Totals*	*Income Level*		
		High	*Medium*	*Low*
20–30	26	6	20	0
31–50	53	0	35	18
50 and over	21	4	15	2
Totals	100	10	70	20

TABLE XII. INCORRECT RELATIONSHIP OF CONTROLLING FACTORS

A glance at these two tables will show that it is not sufficient to know that the totals for each group are correct; the distribution of interviews must also be known. In the second table the interviewer has obtained the correct number of interviews and his totals are correct, yet within the subdivisions the distribution is all wrong.

The high-income group interviews have been concentrated among the under-thirties and over-fifties, and those for the low-income group have been concentrated among the thirties and fifties, the age group which has the highest earning power. This distribution would result in considerable distortion, because it is actually the reverse of what is required, *yet the totals in themselves do not reveal any distortion.*

The interrelationship of the various controlling factors will differ with the survey. It can only be established as the result of experience in handling this kind of sampling and on the basis of information about the controlling factors which is known to be accurate.

Weighting the Quotas

In many cases of quota sampling it will be found that one or more quotas are too small to permit of any accurate statistical analysis, while others are much larger than necessary. In such cases it is common practice to increase the smaller quotas and decrease the larger ones to avoid unnecessary expense. The results must then be weighted to bring them back into their correct proportions and the procedure is as explained in the previous chapter.

CHAPTER XI

THE QUESTIONNAIRE

NEXT TO the actual building up of a representative sample the questionnaire is probably the most important single aspect in any survey. The questionnaire is the outline of what information is required and the framework on which the data is built up. If the questionnaire is faulty and leads to incorrect information, then no amount of analysis and interpretation will put it right.

That is why it is so important to take every care that the questionnaire shall be as foolproof as possible. The accuracy and quality of the information obtained will depend very largely on the skill and personality of the interviewer where personal interviewing is employed. The questionnaire can, however, be of the utmost value in helping the interview to run smoothly and in ensuring the co-operation of the respondent as well as guiding the interviewer.

Basically a successful interview depends on two things:

1. The skill and personality of the interviewer.
2. A good questionnaire.

Respondents are only human, and any reply is liable to errors due to inadequate knowledge, or faulty memory, or because of untruthful replies evoked by considerations of pride or suspicion. It is such errors that a good questionnaire tries to avoid.

A successful questionnaire will be built up as a logical process and will proceed from the first jotting down of points, which it is thought should be covered, through informal interviewing, drafting the questionnaire, piloting the questionnaire and, after possible redrafting, deciding the final form. It is important to

bear in mind that a questionnaire is not just a list of questions. It is a carefully compiled logical sequence of questions directed to a definite objective.

I. THE PRELIMINARY LIST OF POINTS

The first step in framing a questionnaire is to decide what information is required. This can only be decided after a very careful study of the particular problem. Very often the sponsor of the survey does not know exactly what information he requires, but what he will know is the reason why he wants the information and what he hopes to achieve by obtaining it.

The market-research man must, with the guidance of the manufacturer or other concern sponsoring the survey, define the ultimate objective, so that he knows exactly what it is the survey is expected to achieve. When this has been done, an outline of the sort of information that will be required to achieve the desired result will begin to emerge. The information that the questionnaire is designed to obtain must be tied in with the results it is hoped to achieve.

Suppose a survey for the purpose of investigating the market for a new refrigerator and designed to discover consumer habits. What sort of points would be required? The investigator might list the following as points relevant to the survey:

Who have refrigerators?
What are their characteristics?
What brands have they?
Have they possessed more than one brand?
What are the most popular sizes as regards capacity?
What features do people want?
Why did they select the brands they have?
Would any features make present brands more attractive?
How long do they expect refrigerators to last ?
Through what channels did they acquire them?
Do they buy, rent or hire-purchase?
What do they think about service?

Now this may be a fairly comprehensive list for the subject matter of the questionnaire, but it is also necessary to know something about the respondent, and for this purpose the questionnaire will begin with a grid which will give the necessary data about the respondent. These would be details of name, address, age, sex, occupation, income group.

When this preliminary list has been compiled, it will be necessary to consult the manufacturer sponsoring the survey in order to obtain the benefit of his experience on individual points of special importance. Obviously the manufacturer will be the best person from whom to obtain information of a technical nature and it is he who can say what are the technical points to be considered when making the survey.

II. INFORMAL INTERVIEWING

Having listed the points it is thought will be relevant to the survey, it is now necessary to select a dozen or so respondents, as varied as possible, for the purpose of informal interviewing in order to test out the points listed. The interviews are entirely informal and are not controlled by questionnaire or in any other way. They amount, in fact, to a friendly chat or conversation about the subject matter.

The purpose or ultimate objective of conducting the survey is, of course, known, and always in the mind of the executive directing the research work, and he may have a fairly good idea of how he is going to reach this objective and the points that will need to be covered in order to do so. But in order to frame a questionnaire that will lead the respondent logically through the interview, it is necessary to test out his reactions to the points which it is desired to cover.

The informal interviewing is not concerned with discovering *what* people think about the different issues involved; that is what the survey itself will discover. What informal interviewing sets out to do is to find out *how* people think about these issues and *how* they react to them, so that the questionnaire can be framed along the lines of thought which will be most natural to the respondents. This will enable questions to be phrased

in a way which corresponds to the thinking of the respondents and in the order in which they think of them.

In order to lead a respondent to answer a specific question it may be necessary to ask two or three preliminary questions to condition his mind for the important question or to stimulate his memory. Informal interviewing will show where such leading questions are required and how they should be framed and used.

Informal interviewing will often bring out some points which had not occurred to the executive in charge of the work, or to his assistants. In the case of the survey for refrigerators, such a point might be the influence of being able to clean underneath it. A fact which may influence a number of potential purchasers in their choice and which may indicate the need for providing a stand with legs so that the refrigerator can be stood on the floor or on legs which leave a space for cleaning purposes.

The method used in informal interviewing is for the interviewer to enter on the interview with a previously prepared list of points which he uses as a guide. He will not start the interview by mentioning any particular point, but will introduce the subject to the respondent and let him cover as many points as possible without prompting. He will let the respondent talk naturally about the subject but will keep him to the point and not let him go off at a tangent which has no bearing on the subject.

The interviewer must also note any remarks which may be relevant and pursue them until he is satisfied that there is no more to be gained by further probing. It is important that all the points previously prepared should be fully discussed, as also any other points brought up in the interview. This requires a very skilful use of questions and hints in order to get out of the respondent everything that he feels and thinks about these points.

Properly conducted, this kind of informal interviewing will give the researcher an intimate feel of the subject and is particularly important where more technical products are concerned. There is a lot to be said for the executive responsible

for the survey work doing much of the informal interviewing himself, but where this is not possible the interviewer should note the exact words used by respondents so that the executive concerned can evaluate their statements and interpret their true significance.

III. DRAFTING THE QUESTIONNAIRE

The exact form the questionnaire will take and its phrasing will depend on the nature of the survey and the type of respondents. Obviously a questionnaire designed for housewives will vary considerably in these respects from a questionnaire designed for business executives. The informal interviewing will, however, give very valuable indications as to how the questionnaire should be framed and as to the phrasing of the questions.

There are, however, certain fundamental requirements for all questionnaires:

1. A good questionnaire must be as simple as is compatible with the subject matter.
2. It should make it easy for respondents to give the necessary information, while guiding the interview.
3. It should keep the interview to the point while enabling it to be handled tactfully.
4. It should be so arranged that sound analysis and interpretation are possible.

Simplicity in questionnaires can only be comparative. A questionnaire dealing with a household commodity has much more scope for simplicity than one dealing with a technical product. All questionnaires should, however, be as simple as the subject matter will allow, and to achieve this there are certain principles to be borne in mind:

The Questions

Each Question Should Cover One Point Only

An apparently simple question may turn out to be a very involved one, particularly where questions designed to elicit

reasons for a particular action are concerned. For example, in the survey for refrigerators it would be possible to ask: "Why did you purchase this particular brand?" On the face of it this is a simple question, but if we look at the possible answers and combinations of answers it will be realised that it can become extremely involved.

Supposing the respondent had the choice of four different brands, A, B, C and D. All these models were of four feet cubic capacity, the capacity he wanted. The internal arrangements of brands A and B were more in keeping with what he wanted than those of C and D. He was told, however, that brand A was liable to break down frequently, brand C had a good name for reliability. Brand B, which he particularly liked, was out of the question because it could not be adapted to his type of electric power. He finally chose brand D because the hire-purchase facilities were more favourable.

How would he then have answered the apparently simple question? Whatever his answer, he would not have covered all the specific points which came into consideration when he actually made his choice. But if the respondent were taken through each point, he would be more likely to remember their influence and reply specifically. When asked what finally decided him, his answer would show that hire-purchase facilities were the deciding factor in his case.

It is essential, therefore, that all questions should be broken down into their component parts, each of which should be considered separately, thus allowing each question to be concerned with a single idea.

Ambiguity in Questions

The ambiguous question has no place in a market-research survey. A wrongly interpreted question will receive a wrong answer and the question will be wasted; a question must therefore be capable of one interpretation and one interpretation only.

Ambiguity will often arise out of a carelessly worded question. For example, if a respondent were asked "Do you drive a car?" he might interpret this question to mean either *did he own*

a car and consequently drive one, or *could* he drive a car whether he owned one or not.

A question can also be psychologically ambiguous. Such a question would be: "Do you know the horse-power of your car?" The likely answer to this question would be eight, ten, twelve horse-power, as the case may be, but this would not be answering the question. The true answer would be "Yes, I do", or "No, I do not." In such a case the respondent has answered what he felt was the purpose of the question without listening to the form of the question.

Another source of ambiguity is the inclusion of two items in one question. In the question "Do you like the quality and style of X brand of overcoat?" the respondent is only given the opportunity of answering "Yes" or "no", whereas he may like the quality but not the style, or vice versa. To make his point he would have to enter into a long explanation and the interviewer would have difficulty in noting his answer correctly.

Words which are unlikely to be universally understood by the respondents in a particular survey must be avoided. Questions must be worded so that the least educated of the respondents will understand their meaning. Although a number of working-class housewives would understand the question "Is this question ambiguous?" it is conceivable that some would not; whereas the question "Do you think this question can have two meanings?" should be understood by anyone.

Leading and Misleading Questions

A leading question is one which suggests the answer to the respondent. To say "Don't you think that the capacity of X brand of refrigerator is rather small?" is to imply that it is and the answer should be "Yes". Such a question does not ask the respondent to think about an answer but suggests one to him, and unless he is particularly interested in the subject and willing to argue about it he will very likely take the easier course and give the answer already suggested.

Misleading questions usually arise out of biased thinking. For example, the manufacturers of X brand of cigarettes when

framing a questionnaire put in the question "Would you not prefer to buy X brand because of its better quality tobacco?" This sort of thing might be all right in an advertisement but can find no place in an objective study.

Leading and misleading questions result inevitably in introducing a bias into the results.

Helping the Respondent's Thinking

Questions must be worded in the way that a respondent thinks about the particular point it covers. For example, to ask a housewife how many packets of breakfast cereal she uses in a year would mean little to her, because she simply does not think in terms of yearly consumption. She should be asked, instead, how long a packet of breakfast cereal normally lasts. This is a question she would be capable of answering without effort and if the yearly consumption is required to be known it can quite easily be worked out by the researcher and probably with greater accuracy.

Things a Respondent Cannot Know Should Not Be Asked

Here it is important to emphasise that a respondent should only be asked about his behaviour or attitude, past or present. To ask how he expects to behave in the future or what his attitude is likely to be is asking for trouble, because he cannot answer such a question.

It is possible, however, to determine his present attitude to a future possibility, such as "Would you travel by tube if the line were extended to X locality?" Here the respondent can say that if the line ran to the particular locality he would travel by it because it would be more convenient for him or cheaper, or for some other reason. That is, if the line ran to that particular locality today; tomorrow, however, conditions may have changed, the respondent might, in fact, have moved.

Embarrassing Questions

Certain questions will cause embarrassment to certain classes of people, and when this occurs the question should be

changed to approach the subject indirectly, possibly by asking a number of less obvious questions. This difficulty is also encountered where pride and social position are involved.

For example, a middle-class housewife, when asked what magazines she reads, would probably name a number of good-class magazines but would omit to mention those she considered to be "low-brow". The usual method of overcoming this difficulty is by observation or by asking specific questions which would indicate the respondent's knowledge of the magazines in question.

Intensity of Phrasing

The intensity of phrasing in a question will affect the reply. For example, if a respondent is asked whether he thinks an article is expensive he may say "No", but he may still not think it cheap. On the other hand, if he is asked whether he thinks the price is reasonable he would say "Yes".

Where the intensity of a question is likely to affect the answer, it is best to re-word the question and list all possible answers. The question here could be re-worded thus: "What do you think about the price of article X?" The possible answers could be listed as:

Very expensive.
Expensive.
Reasonable.
Cheap.
Very cheap.

Whatever the reply of the respondent, it would be ticked off against the appropriate comment.

The Questionnaire

When all the necessary questions have been framed and checked for possible flaws, they must be brought together in a questionnaire so that they will form one logical sequence that will enable the interview to run smoothly and conversationally.

There are certain principles which must guide the actual collation of the questions.

Length

The length of the questionnaire depends on the nature of the survey and the degree of interest the respondent is likely to have in the subject. It would be reasonable to assume that an enthusiastic photographer would be more willing to answer a long questionnaire about his hobby than a housewife about household commodities. Again, a prosperous housewife might not be so willing to give as much time to an interview as a less prosperous one.

On the whole, however, it is best for questionnaires to be as short as possible. Respondents are more likely to maintain their interest for a short length of time than for a long one. A long questionnaire is open to the danger of causing boredom before it is completed or of being discontinued in the middle for some reason such as an appointment or engagement.

The Opening Questions

In any interview it is essential to begin in such a way as to arouse the interest of the respondent and ensure co-operation. This can be done by giving the respondent a brief account of the study which immediately takes him into the interviewer's confidence, a fact which makes co-operation more likely. The name of the product or the manufacturer or other sponsor must not be mentioned as this would tend to create a bias in favour of the sponsor.

To build up the necessary confidence between interviewer and respondent, the first few questions should be simple and likely to arouse interest. Difficult questions which the respondent might not be able to answer and which he might construe as casting reflections on his intelligence or education must be avoided at the beginning of the interview if the interview is not to be cut short. If such questions are inevitable, they must be left to the end of the interview, by which time confidence will have been built up, and when, if the interview is cut short, it will not be of such consequence.

The Position of Particular Questions in the Questionnaire

The influence of one question on a subsequent question is of particular importance. It frequently happens that one question will suggest the answer to another question or at least influence the answer. For example, if a questionnaire begins by asking the respondent about brands he may not mention a particular brand because it is unimportant to him or because he knows little about it, a fact which may be of great importance. If, however, that brand had been mentioned in a previous question, the respondent would remember it and mention it at the subsequent question, thus introducing a bias.

It is natural for a respondent to become more indifferent to the questionnaire as it nears the end and because of impatience or tiredness may give careless answers to later questions. Those questions, therefore, which are of special importance should, if possible, be included in the earlier part of the questionnaire. Another device is to include stimulating questions at intervals which will tend to increase the interest of the respondent. Specially important questions can be fitted in closely after such stimulating ones.

Personal Questions

The best place for personal and embarrassing questions is in the body of the questionnaire, after enough confidence has been obtained. They should appear to arise naturally from previous questions and be led up to gradually so as to ensure co-operation. These are questions relating to income, ownership of various goods, house furniture, etc., hire-purchase arrangements, education, occupation and other personal details.

It is also a good practice to include these at the end of the questionnaire so that should the respondent take offence at a highly personal series of questions the other information will already have been collected. Similarly with questions which are likely to reflect a person's ignorance, because they are unlikely to know the answers and which will often cause irritation or annoyance.

Aiding the Respondent's Memory

The questionnaire must be built up logically so as to help the respondent to remember by making the problem as concrete for him as possible. If a man is asked what he did at 9 p.m. the day before yesterday, he will have a certain amount of difficulty in remembering, but if he is first informed that the day before yesterday was Monday, and then asked at what time he left the office, he will associate his actions with the day and he will picture himself leaving the office and what he did subsequently.

Thus the order of questions should fit in with the respondent's own train of thought. A chronological order is most useful when it is a question of remembering what happened at a particular time. When it is desired to uncover motivating influences it is often best to lead a respondent back from the surface reply to the underlying motives or causes.

Once a train of thought has been started, it is important that it should not be broken by any sudden and disconnected question, thus to achieve the best results a respondent should be led gradually from one subject to another.

Helping the Respondent to Express Himself

Many people who have good memories and are willing to co-operate lack the capacity to express themselves clearly, and this is particularly true when it is a question of attitudes, which must be indicated precisely. In such cases it may be necessary for the interviewer to introduce a series of short simple questions which will help the respondent to express himself.

It often happens that a respondent will give an answer which can only be described as vague. For example, asked why he uses a product, a respondent may answer: "Because I like it," or "Because it is the best." These answers do not contribute much to the results of the survey and it is necessary to ask "specifying questions" which will elicit the required information. Thus the respondent might be asked: "What do you particularly like about it?" or "Why do you think it is the best?"

IV. PILOTING THE QUESTIONNAIRE

If the research worker has proceeded along the lines outlined above, he will have studied the problem and noted what he considered suitable points for investigation. He will then have interviewed informally a dozen or so respondents to test their reactions to the subject of the enquiry. On the basis of these reactions to the previously noted points, the research worker will then produce a questionnaire according to the principles outlined in Section III.

In this form, however, the questionnaire is still a highly dangerous document. It is a document which has been evolved by one mind, or possibly two or three, trained in a very specialised way. Until it has actually been used in interviews with the respondents in which the survey is interested, it is impossible to say whether it is going to achieve the desired results and avoid misunderstandings. For this reason it is necessary to pre-test the questionnaire before it is used in the survey proper, to make sure that it meets all the requirements of the survey and contains no flaws. If it does, then the pre-test will show up the flaws and they will have to be corrected. This procedure is technically called "Piloting the Questionnaire". In other words, a pilot test is carried out as a guide to the survey itself.

The importance of pre-testing a questionnaire arises from the fact that no two surveys are really alike, and however much experience we may have in framing questionnaires, every survey will present us with new problems and difficulties peculiar to itself. For this reason, unlike in a mathematical problem, it is impossible to say that a particular questionnaire answers the particular problems of a survey before it has been tested against the reactions of the respondents.

In concrete terms, the purpose of piloting a questionnaire is to discover the following:

1. Whether the questions as they are framed will achieve the desired result by obtaining the required information. It will sometimes be found that although a question is

perfectly plain to the research staff it will have a slightly different meaning for the housewife. In such a case a slight change of nuance will get the housewife to answer it correctly.

2. Whether the questions have been placed in the best order to enable the interview to run smoothly. As already explained, it is of the utmost importance to ensure that the interview runs smoothly in the form of a logical conversation.
3. Whether the questions are understood by all classes of respondents. This is, of course, vitally important in surveys concerned with all classes of respondents from the university graduate to the almost illiterate. Obviously questions must be simple enough for the latter to understand, but not so worded that the former will take offence. It may be sometimes necessary to provide two different wordings for the same question, in which case it will be necessary to ensure that both mean exactly the same thing.
4. Whether any bias is being introduced by the questions themselves or the way in which they are put. Apparently innocent questions may be found to be ambiguous, leading or misleading when put to the respondent. The way in which they are put, or the preceding questions, may tend to introduce the same sort of bias.
5. Whether additional or specifying questions are needed or whether some questions are redundant and should be eliminated.
6. Whether the instructions to interviewers are adequate. These instructions must cover all problems likely to be met with in the interview and it will thus be necessary to reconsider the instructions in the light of problems brought out in the "pilot" test.

The procedure for piloting a questionnaire is that a small number of respondents is selected, who are representative of the types of respondents to be interviewed in the actual survey. At this stage we are not interested in any statistical analysis

but merely with the form of the questionnaire, and for this reason it is only necessary to ensure the representativeness of types.

Some questionnaires will be proved satisfactory after the first test, others will have to be tested several times before the questionnaire is deemed satisfactory. Obviously, if the questionnaire is found to fail in any respect, changes will be needed, but these changes must also be subjected to tests. The actual number of tests in a "pilot" will naturally depend on the complexity of the subject.

Interviewers employed on pre-testing must be highly skilled. In the interviews they should employ the set questionnaire as it is at the time, but they are allowed a wide scope in putting the questions in different ways if the first attempt fails. It is very important, however, that the interviewer should make complete notes to show exactly what he has done.

After the interviews are completed, all the interviewers who were employed in the pre-test should be gathered together and the questionnaire should then be subjected to a searching enquiry in which their views and impressions should be ascertained. There is much to be said for the research director in charge of the survey carrying out some of the interviewing personally, as by doing so he will obtain a much better grasp of the problems involved.

V. THE FINAL FORM

If the questionnaire has been subjected to a thorough "pilot" test, the final form of the questions and the questionnaire as such will have emerged automatically. All that will remain to be done will be the mechanical process of setting out the questionnaire in its final form.

This will involve:

1. Separating out main questions and dependent questions.
2. Numbering questions.

3. Cross-referencing.
4. Inserting instructions in their appropriate place.
5. Pre-coding (where mechanical tabulation is used).

An example of a questionnaire in final form is included at the end of this book.

Chapter XII

THE COLLECTION OF DATA

Market research can be concerned with the collection and analysis of two different kinds of data: (1) that which has already been assembled and recorded; and (2) that which still requires assembling and recording.

The collection of already assembled and recorded data does not involve any very elaborate techniques. It is largely a matter of knowing where the required material is to be found and organising it in a way most suitable for the purpose at hand.

The applications to which this kind of data can be put, whether collected internally in the course of doing business or whether specially collected from outside sources, have already been discussed in Chapters IV and V. It is therefore proposed to confine the present chapter to the process of collecting unrecorded data by the use of special techniques.

There are several methods of collecting data in market research, and their respective applications will be considered in a later chapter. The basic and most widely understood method is that of personal interviewing, and for this reason the present chapter will deal with this method in particular though much of it will be applicable to other methods.

ORGANISATION

Whether the company sponsoring the research undertakes the survey work itself or whether this work is carried out by an independent agency, some form of organisation is required if the work is to proceed smoothly. The basic form of organisation must obviously be related to the actual work to be done. In survey work the steps can be broken down as follows:

Planning	Definition of the problem.
	Building up the sample.
	Framing the questionnaire.
Checking the plan	Pilot work.
	Testing and re-testing.
Field work	Interviewing.
	Supervision.
Analysis of data	Editing.
	Tabulation.
	Calculation.
	Statistical analysis.
Interpretation	Drawing conclusions.
Reporting	Facts.
	Recommendations.

The director of research will normally be responsible for the planning, the interpretation and reporting, though in these tasks he will normally be aided by one or more assistants, depending on the size of the survey. The director and his assistants will have had a wide experience in all phases of the work and will also be fully conversant with marketing problems so that the practical applications of the work will not be overlooked.

Tabulation of the data and the arithmetical calculations involved are entrusted to a clerical staff specially trained for this purpose under the supervision of the director and his assistants, who will also be responsible for editing the questionnaires. Where machine tabulation is used, one or more operators will be necessary unless the services of firms specialising in machine tabulation are employed.

Statistical experts are usually employed for the purpose of building up the sample and the subsequent statistical analysis of the results, though this work can be undertaken by assistants who are trained in this type of work.

For the field work, a market-research office will normally have a staff of trained supervisors and a small number of highly skilled interviewers for the pilot work. Within this framework "free lance" interviewers are engaged for special studies,

though the tendency nowadays is for the research office to recruit permanent field workers. Whichever method is used, it is, however, the normal practice for the field workers to be entirely separate from the tabulating staff and those engaged in planning and analysis.

EXPLANATION OF PURPOSE AND OUTLINE

If an interviewer is to carry out his work intelligently, it is essential that he should be given an explanation of what the survey is about. This explanation should not, however, be too detailed, as too intimate a knowledge of the study may influence the attitude of the interviewer. For example, in a brand study concerned with breakfast cereals, the interviewer can safely be told that the survey is for the purpose of establishing certain facts about the use of branded breakfast cereals. It would, however, be unwise to specify which brand is sponsoring the survey, as this knowledge might well influence his attitude, and destroy his objectivity.

On the other hand, complete ignorance of the purpose of the survey would be harmful to the survey. Most interviewers are trained observers and will be continually absorbing impressions in the course of their work and noticing pertinent facts, and unless interviewers know what impressions and facts are relevant these may be lost through failure to recognise them as such.

What an interviewer should be told about a survey is a matter of judgement on the part of the director. In general, however, he should be told anything which will help him to make his work comprehensive and purposeful, though he should not be told anything which may affect his attitude to the work.

FORMS

In formal interviewing the interviewer will be supplied with printed questionnaires and a copy of interviewing instructions. It is important that the interviewer should stick to the questionnaire in the form in which it is printed and not insert questions

of his own, which, though intended to help the respondent, may be leading questions and may result in introducing bias into the interview. An interviewer should, however, be allowed a certain amount of discretion if interviews are not to become abortive. This discretion can be instilled by training and by the inclusion of specifying questions in the questionnaire to be used if necessary. The interviewer must not, however, attempt to explain or interpret the questions to the respondent.

INSTRUCTIONS

Instructions to interviewers should be given verbally and the interviewers tested to see that they do understand them. Each interviewer should also be given a printed sheet of instructions to which he can refer in the field, as and when the occasion arises.

Instructions should, of course, be clear, concise and complete and should cover the complete daily routine required from the interviewer. In other words, he should be told whom to interview, how and when to interview, and in the case of quota sampling how to select his respondents. Generally the instructions to interviewers should cover the following points:

1. An explanation of the purpose of the survey.
2. Details of what interviews are required. (In area sampling this will consist of lists of names, or streets and residences; in quota sampling a description of the types of respondents and the numbers required for each type will be given.)
3. The best times for interviewing various respondents.
4. How the interviewer should introduce himself.
5. How he should conduct the interview.
6. Special points regarding the questionnaire and what difficulties may arise and how they should be handled.
7. When and how to call back where calls are abortive.
8. When and how to send in reports.
9. How reports should be made out and what editing and checking is expected from the interviewer.
10. Who to contact in cases of difficulty.

The interviewer is a lone wolf, and if he begins the day's work without understanding properly what is required of him the whole of his day's work may be useless, since he will seldom call at the research office until his work is completed. It is therefore of the utmost importance that he should be adequately briefed.

WHOM TO INTERVIEW

An interviewer can be instructed to call at every tenth house in every street in his area, or he can be told to call at every grocer's nearest to every street intersection. In quota sampling he can be told to call at seven class A B homes; thirty class C homes, etc. It is also important that he should interview the right person at each call. When calling on private residences the interviewer might be interviewed by a child or even a servant unless he is told specifically whom he must see. If he is required to interview housewives, he must be told so and a space must be provided on the questionnaire where this fact can be registered for checking purposes. In every case the housewife may not be available; the interviewer should be told in his instructions within what limits his discretion lies. A paid housekeeper may be an adequate substitute, but it is unlikely that a housemaid would be.

THE CONDUCT OF THE INTERVIEW

The first impression made by the interviewer is of the utmost importance, and the ultimate success of the interview will often depend on a good introduction. If necessary, suitable introductions should be prepared in advance so that no time is lost in lengthy explanations and so that a good impression is created at the start.

Whether or not the questionnaire is to be used openly is another important point on which the interviewer should be guided. The use of check lists or cards by respondents or by interviewers needs careful explanation. What points the interviewer must observe and those he should not attempt to discover by questioning should be fully covered.

Terms should be well defined, especially where the interview covers some technical aspect. For example, in a survey concerned with packaged flour, the interviewer should know the meaning of such terms as are used in baking. Or in a survey of dealers concerned with terms of trade, the interviewer should understand the different kinds of margins and how they are calculated.

SUPERVISION

Adequate supervision is an essential part of any field work and no large band of interviewers should be allowed to roam the field without being properly supervised. Normally supervisors will be responsible for training and briefing interviewers for a specific study, and for this reason each supervisor will know the interviewers for whom he is responsible and will know at what points supervision is required. In some highly technical surveys which employ highly skilled and responsible interviewers supervision will be unnecessary.

Each interviewer should check over his day's work with the supervisor daily so that difficulties can be overcome and errors checked. This is important for the purpose of eliminating doubtful points in the questionnaires which would result in difficulties at the time of tabulation and analysis. It is a form of on-the-spot editing by the supervisor which has the advantage of being done while the memory of the interviewer is still fresh.

In addition, supervisors must check that interviewers have called on the right people or obtained their correct quotas of calls for various groups. The supervisor must also make a percentage call-back on the respondents themselves to ascertain whether the interviewer has carried out his work correctly. This will eliminate dishonesty on the part of interviewers and is essential in any well-conducted survey.

INTERVIEWING

An interview involves a meeting between two persons: the interviewer, who knows what information is required and who must obtain it from the respondent; the respondent, who knows

the answers but who must be guided and questioned if his answers are to be relevant and adequate.

Although a set questionnaire will be used, it must be accompanied by instructions to the interviewer within the limits of which each interview must be conducted. Since no two respondents will be identical, interviews are bound to vary to some extent and this variation will require the interviewer to use some discretion in the way in which he conducts the interview, though he must not go outside the limits set by his instructions and the questionnaire.

The quality of the information obtained will to a large extent depend on the conduct of the interview, and here it is relevant to set out some of the factors on which quality will depend.

Lack of Bias

Bias can be easily introduced during the interview by the attitude of the interviewer or the way he puts his questions. If the interviewer tries to assist the respondent by introducing leading questions or remarks which indicate the answers he expects, he will often get those answers whether they are right or wrong. Further, by his tone of voice or by emphasis on certain words, the answers to straightforward questions can be influenced.

Completeness

It is necessary that the answer to every question should be complete, and it is the duty of the interviewer to satisfy himself on this point before passing on to the next question. In a survey concerned with a breakfast food, the question was asked: "Are you influenced in your purchase by the way in which the breakfast food is packed?" Now to this question the answer "No" may be complete or it may not. A short answer like this may cover a great deal of information that it is important for the survey to elicit. In this case a complete answer might well be that the packaging does not influence the purchase more than, say, quality or flavour, but all other factors being equal the respondent would be influenced in her choice by an

attractive package. In such cases the interviewer must probe by asking further qualifying questions and should not be satisfied until he is sure that he has discovered exactly what is in the mind of the respondent.

This particular question is, of course, a bad one and would be unlikely to produce a complete answer, because very few people are capable of analysing their reactions sufficiently objectively to give a truthful answer. This question should have been broken down to elicit by question and observation how the pack was used and what was expected of it so that it could later be assessed against the qualities required of it.

Accuracy

A well-completed questionnaire should be an accurate record of what occurred at the interview, and should, for preference, be completed at the time of the interview or as soon as possible afterwards. Unless this principle is followed, distortions, caused by the interviewer failing to remember accurately or confusing two or more interviews, are likely to occur. It is equally important that the interviewer should be careful to note what he actually hears and not what he expects to hear. It can easily happen that after a number of interviews where similar answers have been obtained, a trend will unconsciously establish itself in the mind of the interviewer and he will begin to anticipate the answers. The danger is that the interviewer will wrongly understand the meaning of the respondent. For example, many people assume, as a matter of course and almost unconsciously, that the most expensive brand is the best, although they have never tried other brands. At an interview they may well say that they buy it because it is the best, and unless the interviewer is alive to this he may record the reason for purchase under "quality" whereas it is nothing more than prejudice.

Honesty

Honesty on the part of the interviewer is, of course, of the utmost importance. It has not been unknown for interviewers to sit in a bar or at home and complete their questionnaires

purely from their own imagination. Or more dangerous still, because it cannot be so easily detected, fill in some of the questions at interviews and complete the rest from their imagination. Most of this kind of blatant dishonesty will be eliminated by supervisors making percentage check calls. In any case, any batch of questionnaires completed in this way will not be consistent with the general trends of the enquiry and this fact would be immediately detected in the research office, though not until much time and money had been lost.

Consistency

It is, of course, important that there should be internal consistency in the answers to every questionnaire and there is nothing more irritating to the research office than an unexplained discrepancy in the answers to a questionnaire. Such discrepancies usually mean that part of the completed questionnaire is useless, but often the doubt caused will mean the scrapping of the whole questionnaire.

It is the duty of interviewers to watch for inconsistencies, and where inconsistent answers are received from the same respondent it is the interviewer's responsibility to find out what is the true answer. Differences may easily occur through a failure to understand, inattention to the question, or other reasons; it does, however, happen that inconsistencies must stand in questionnaires for some reason or other. In these cases it is essential that the interviewer should include a full explanation in his report.

Procedure

Each interviewer should make a few trial calls before starting the interviews allotted to him. If interviewers check with their supervisors after making the trial calls and before starting the working calls, there will be much greater certainty that calls will be made and interviews completed as the research office wants them to be.

To obtain real co-operation from a respondent, an interviewer must create a friendly and co-operative atmosphere. To do this, in addition to greeting the respondent adequately

and making a short and interesting statement of what he is doing, the interviewer must also be careful to time his calls in relation to his respondents' convenience. To call during business hours on a housewife who also goes out to work would obviously be useless, but to call on a working-class housewife on washing day would hardly ensure co-operation on her part.

Instructions must be carefully followed. Interviewers must ensure that the respondents they interview are in line with the sample requirements given them. Questions must also be asked as written in the questionnaire. If from the response given it is obvious that the question has not been properly understood, then it should be asked again. Instructions should cover such points, and interviewers should adhere to their instructions.

THE INTERVIEWER

There can be no cut-and-dried rules as regards the requirements of an interviewer, since the type of interviewer required will depend to some extent on the nature of the survey. Interviewers must, like salesmen, be selected for the job. In the same way that the salesman used to sell machinery to the industrial executive is a different man from the one who sells groceries to grocers, the interviewer employed to interview business executives is of a different calibre from the one employed to interview housewives.

Similarly, a poorly educated person cannot be used for interviewing among highly intellectual and cultured people; nor should the interviewer be so far above the respondent in intellect and culture that no true and natural communication of ideas is possible. The social position of respondents is one of the most difficult problems met with in interviewing, and although interviewers are versatile by nature, some will be better than others in certain social groups.

Age is another factor which should be considered. Although in the average survey, which takes in all age groups, it would not be possible to allocate interviewers to respondents on an age basis, there are a great number of surveys which are concerned only with particular age groups; in such cases inter-

viewers can be selected so as to avoid a very marked gap in age between interviewer and respondent, a fact which will help to create confidence.

There is also the question of sex to be considered. The main consideration must, of course, always be whether or not the interviewer is a good one and generally, if the interviewer is a good one, the question of sex is unimportant. There are, however, research jobs where men are better than women and others where women are better than men. Most women have some sort of a domestic background and for this reason women interviewers are considered better for interviewing housewives. It is generally easier for a woman to obtain a housewife's confidence on questions which are regarded as the woman's province.

On the other hand, there are kinds of interviewing where men are more suitable, as, for example, in the case of technical subjects where men are normally more at home than women. When it comes to interviewing top executives, they can be handled equally well by men or women, though as a general rule men would be chosen, given equal qualifications. A top executive would be more at home discussing business with a man and would tend to look on a woman interviewer with amusement. On the other hand, a woman will often get better interviews and will sometimes be seen by top executives, when a man would not stand a chance, simply because of a man's natural chivalry towards a woman.

In general, however, a market-research interviewer, whether man or woman, should possess certain qualities, and it is recognised that the following should be possessed by the good interviewer:

1. *A better than average education* with the versatility of mind which is the product of a good education. The educational standard should be at least that of the school certificate and if possible a university training.
2. *A pleasing personality*—the type of personality which is open and makes people want to please. An interviewer is trying to get the respondent to do something for which

he receives nothing in return, added to which the respondent is a complete stranger. Not only must the interviewer create a good impression at first sight, but he must be able to influence the respondent so that the latter is almost eager to help.

3. *The ability to mix.* The interviewer must be prepared to meet all classes and all types of people. He must feel at home, not only in the presence of the navvy or the working man's wife, but also in the presence of the city magnate and the society woman.
4. *An inquiring mind.* The interviewer's attitude of mind must be such that he is only satisfied when every bit of available information has been gleaned. He must not only be satisfied with bare facts, but should be always probing behind the facts to discover the reasons for them.
5. *Precision.* The interviewer must have the ability to record facts precisely and must think precisely. Woolly thoughts and woolly expressions have no place in the research man's make-up. Not only must he understand what he is trying to say or write, but he must be certain that the listener or reader will understand equally easily. He must be able to convey facts and ideas as received and without any additions of personal influence or bias.
6. *Observation.* Much of the data in market research is obtained by observation. An eye for detail is a very useful quality not only in observing physical surroundings but in observing respondents in the way they react. An ear for detail is equally useful in noting small points which may be important and in noting differences in voice inflections.
7. *An extrovert's attitude* towards other people. The interviewer should be intensely interested in other people and their problems and should delight in the society of others. He should feel a real sympathy for the opinions and attitudes of others.
8. *Integrity.* An interviewer is a lone wolf and it is essential that he should be both reliable and honest. Although supervision and other checks can eliminate deliberate

dishonesty, they are not primarily designed for that purpose but rather to discover and eliminate honest mistakes. In any case, it is only possible to actually check in the field a small proportion of an interviewer's work.

9. *A good memory.* Obviously a good memory is essential if an interviewer's reports are to be accurate; it can, however, be considerably assisted by completing reports as soon as possible after interviews.
10. *Commercial knowledge.* Experience in the problems of business, sales, advertising, marketing, etc., is, of course, extremely useful to enable the interviewer to really understand the purpose of everything he is required to do. In interviewing dealers and other businessmen such knowledge is invaluable and can be of considerable help.

Of course, it will be seldom that an interviewer will possess all these qualities; that would be the ideal. They are, however, qualities, the possession of which goes towards successful interviewing and they should be looked for when selecting field workers. In the end it will be necessary to compromise and accept interviewers with only a proportion of these characteristics. A good method of selection is to allocate points to each quality and give each candidate a number of points for the degree in which he possesses any of these qualities. All points are then totalled and if the total equals or exceeds a previously agreed pass mark the candidate is accepted.

Chapter XIII

THE TABULATION OF DATA

It is not until the completed questionnaires are received from the interviewers that the real work of the research office begins. It must, of course, begin by creating some sort of order in the mass of questionnaires with their innumerable answers, before it is possible to arrive at any conclusions and prepare a report on the findings.

A market-research survey is usually concerned with the collection of two kinds of data: *quantitative data* and *qualitative data*.

Simple quantitative data consist only in the establishment of numerical facts such as might be provided by the questions:

1. "Do you use a breakfast cereal?"	The answers to this question would establish the number of people who use a cereal and the number who do not.
2. "What size packet do you usually purchase?" "How often do you purchase?"	The object of these two questions is to discover the quantities of cereal purchased over a time period and can be related to brand questions to establish quantities by brand.

Answers to this type of question will establish that X people use a product, Y people do not: £X is spent yearly on a product of which Y quantity is purchased: 40 per cent use brand A; 35 per cent use brand B; 10 per cent use brand C; and 15 per cent all other brands. This is pure quantitative data, the analysis of which is comparatively simple.

Qualitative data, on the other hand, is concerned with people's opinions, their reasons for doing things and other more or less

intangible facts. In market research, however, it is usually necessary to give some quantitative significance to qualitative data, so that it loses its purely qualitative aspect and becomes related to figures. Obviously, to be of any use in marketing, qualitative data must often have a numerical significance.

Supposing that a survey were conducted to establish people's preferences for certain brands of cigarettes, and one question, where relevant, was concerned with discovering why people changed brands. It would be of no use whatsoever to know that some people changed from A to B because cigarette A was too mild, unless that fact were related to a quantity representing the number of people who changed for this reason.

In cases of this sort it is usual to pick out the most important reasons quantitatively, and list them in their order of importance and lumping together reasons which seldom occur. The results would look like this:

Reason	A	31	per	cent
,,	B	20	,,	,,
,,	C	16	,,	,,
,,	D	8	,,	,,
,,	E	7	,,	,,
other ,,		18	,,	,,

In this way it is possible to give a quantitative meaning to purely qualitative facts.

A mass of collected facts has no meaning until treated in this manner, and to be of any use from a commercial point of view facts must have a definite value expressed quantitatively; the only way to do this is to convert all answers into numbers which can be used for explanation and description.

Before facts can be connected to numbers it is essential that all facts covered by the same number should have the same value and thus mean the same thing. To arrive at this result there are four essential steps in tabulation:

1. Examination for quality.
2. Editing.
3. Classifying.
4. Counting.

Each one of these steps is not necessarily completely separate from the other steps and they often merge one into another. This is particularly true of Examination for Quality and Editing which are often done at the same time, and for Classifying and Counting where the method of classification may involve an automatic count. The four steps are, however, quite distinct, and to really understand the whole process of tabulation it is necessary to consider them separately.

EXAMINATION FOR QUALITY

The purpose of this examination is to determine the quality of the individual interviews. As already explained, the quality depends on a number of factors, and by a careful examination of the completed questionnaire it is often possible to pick out the points which need adjusting in order to improve the quality and to reject answers which are inacceptable for one reason or another.

The interviewer must be continually consulted during this process so that any point which is not quite clear to the examiner can be explained by the interviewer. The nature of the interviewer's work often makes it necessary for him to write hastily, and for this reason his ideas may not have been clearly expressed or his writing may be illegible. By checking over the questionnaires with the interviewer and raising those points which may be misinterpreted, any such difficulties are overcome immediately and will not be left to hinder the work of tabulation.

It is obvious that for this process the questionnaires must be kept in separate bundles for each individual interviewer. This will also enable the examiner to spot any consistent error or bias running through all the questionnaires of a particular interviewer. Any such error or bias is likely to be peculiar to an individual interviewer and could never be noticed once all the questionnaires were mixed up. Where quota sampling is used, by separating the questionnaires by interviewer it is also possible to ascertain whether each interviewer has obtained his correct quotas of interviews.

Examination for quality is necessary for the following purposes:

1. To determine whether there is any consistent error or bias in the work of individual interviewers.
2. To determine whether particular interviews or particular answers are acceptable.
3. To determine whether the questionnaire was properly handled.
4. To eliminate errors or recording.
5. To clear up doubtful points.
6. To check the interviewers' quotas (in quota sampling only).
7. To show up the sub-standard or dishonest interviewer.

This last purpose is achieved by a general comparison of the work of all interviewers. By comparing their work one with another, interviewers, whose work does not follow the general pattern, can usually be easily detected and the reasons for divergence can then be investigated.

EDITING

The purpose of editing is to prepare the questionnaire for tabulation. Where thousands or even hundreds of people have been asked the same question, their replies will tend to adopt a variety of phrasings although the answers may have identical meanings. But before a number of answers can be lumped together under the same heading and counted, it is necessary to ensure that they do in fact mean the same thing, and to indicate this fact by a common symbol so that the classifiers know exactly where to put each answer on their tabulation sheets.

In straightforward questions where the answer is either "Yes" or "No", very little editing is needed except to ensure that the answer is consistent with the remainder of the questionnaire and that the question has not been misunderstood. With questions which permit of a variety of answers, however, editing is very necessary. There are frequently different shades

of meaning in answers to the same question and the editor must decide when an answer should come under one heading and when it shades off into a different meaning so as to bring it under a different heading.

Again, where it has been necessary to ask a series of qualifying questions or to obtain the answer to a question by a roundabout process, the editor will usually eliminate the additional questions and answers and insert the answer to the main question in its proper place to enable the classifier to run straight through without having to bother with extraneous questions.

During the process of examining questionnaires for quality, each questionnaire will be examined as a unit and then all the questionnaires of an interviewer will be examined as a series. Where incorrect or inconsistent answers are found they will have been eliminated during this process. In editing, on the other hand, each part of the questionnaire will be examined separately and question No. 1 will be examined in all the questionnaires before passing on to question No. 2. This procedure enables the editing to be consistent throughout.

Very often missing answers can be deduced or incomplete answers completed from the remainder of the questionnaire. This is particularly true in the case of a series of interlocking questions. A simple example of this is where a respondent has not replied to the question whether or not he owns a car and in a later question says that he bought one on hire-purchase terms. Provided the remainder of the replies are consistent with this, the answer "Yes" can be inserted for the first question. It is, however, important that this should be done during editing because a tabulator faced with a blank will usually ignore it.

A very important function in editing is concerned with numerical answers. Most ordinary commercial surveys involve questions to which the answers are in terms of numbers. Before these can be tabulated, it is important that all the numbers should be converted to similar units. For example, the answers to a question on time might be in months, weeks or days. Lengths might be described in yards in some cases, feet in others and inches in yet others. Some common unit must be chosen

which will best serve the purpose of the survey, or because of ease of tabulation, and where answers are not given in the chosen units they must be converted.

In questions dealing with the more intangible facts, such as those concerning opinion and reasons, the respondent is often allowed a great deal of latitude in answering. This means that the answers will vary greatly and are apt to be numerous. As it is usually impossible to cater for all answers, the normal procedure is to select half a dozen or so which occur most frequently and classify all answers into those categories, those which are not capable of being classified in this manner are relegated to an "others" category, though it is important to see that no frequent answer is thus relegated. This is, of course, an editing responsibility.

To ensure uniformity, particularly where there is more than one editor, it is useful to use a system of coding. This is usually done by giving each possible answer a number which the editor writes on the form. Sometimes, even, questionnaires are coded in this manner before the interviews. It is also worth noting that any marks made by the editor on the questionnaire should be made in coloured ink or pencil to avoid any confusion with the interviewer's work.

CLASSIFYING

Once the questionnaires have been edited they are ready for classification. The first step is usually to sort the questionnaires into several groups. These groups will very often represent income groups, age groups or other factors which are particularly relevant to the study. This will, of course, be particularly important in quota sampling where this initial classification will be usually done according to the chosen controlling factors for the survey.

The actual techniques of classification can only be learnt by practice in the work and it is impossible to become an expert in this field by merely reading a book on the subject, because the method will vary with the study and it is usually a matter of some ingenuity to devise the method of classification, which is

best suited to the actual problem at hand; experience in the work is usually the best guide.

It is, however, possible to indicate some general lines.

Quantitative Data

For example, in a survey dealing with breakfast cereals it may be desirable to break down by income groups and by age groups. In such a case all questionnaires would be sorted into separate piles representing income groups and these would then be further sorted according to the age of the respondent. Forms would then be prepared for each question. A suitable method would be to have a separate form for each income group broken down into sections representing the age groups of respondents. Such a form might be as shown in the following figure.

Q.1 "*Do you use a breakfast cereal?*"		*GROUP* "*High*" 200
Answer	*YES*	*NO*
AGE *Under 30*	(30)	I (41)
30–50	II (62)	I (21)
Over 50	IIII (24)	(20)
REJECTS 2		

FIG. 10. TABULATION FORM

Supposing the second question deals with brand preference, a form such as the following might be suitable:

Q. 2 "*What brand do you normally buy?*"				*GROUP* "*Medium*" 1610	
Brand	A	B	C	D	Other
AGE *Under* 30	𝍸 𝍸 𝍸 𝍸 𝍸 etc.				
30–50					
Over 50					

FIG. 11. TABULATION FORM

It must be noted that in such a case a large number of replies will probably indicate that two or more brands are normally purchased, in which case a mark would be inserted under each brand mentioned during the editing of the questionnaires.

In a survey of this kind dealing with different brands which are directly competitive it will often be necessary to establish not only what brands are normally bought by the various categories of respondents but also how each brand stands in relation to the others. Almost invariably there will be differences in price and differences in the size of the packets of different brands. It is therefore essential as a first step to establish some common denominator.

Supposing that the sizes of the four main brands were related to each other in the following way:

Brand A small size 8 oz.
large size (twice small size)
Brand B one size (1½ times small brand A)
Brand C one size (1¾ times small brand A)

Brand D large size (3 times small brand A)
small size ($1\frac{1}{4}$ times small brand A).

Here the common denominator would be the small size of brand A and all other brands would be related to that in the following manner:

Small brand A = 1 (8 oz.)
Large brand A = 2
Brand B = $\frac{3}{2}$
Brand C = $\frac{7}{4}$
Large brand D = 3
Small brand D = $\frac{5}{4}$

Having thus established the interrelationship of the various brands, it is now necessary to establish the frequency with which each brand is purchased, and for this purpose it is useful to established a CLASS INTERVAL which might be as follows. A packet lasts:

From 1 to 3 days
,, 3 ,, 6 ,,
,, 6 ,, 9 ,,
,, 9 ,, 12 ,,
,, 12 ,, 15 ,,

If a small packet of brand A lasts 4 days, that means one unit in the class interval 3-6.

If a large packet of brand A lasts 7 days, that means $\left(\frac{7}{2} = 3\frac{1}{2}\right)$ one unit in class interval 3-6.

If one packet of brand B lasts 5 days, that means $\left(\frac{5}{\frac{3}{2}} = \frac{10}{3} = 3\frac{1}{2}\right)$ one unit in class interval 3-6.

If one packet of brand C lasts 4 days, that means $\left(\frac{4}{\frac{7}{4}} = \frac{16}{7} = 2\frac{2}{7}\right)$ one unit in class interval 1–3.

If one large packet of brand D lasts 19 days, that means $\left(\frac{19}{3} = 6\frac{1}{3}\right)$ one unit in class interval 6–9.

If a small packet of brand D lasts 6 days, that means $\left(\frac{6}{\frac{5}{4}} = \frac{24}{5} = 4\frac{4}{5}\right)$ one unit in class interval 3 – 6.

During the process of editing, these figures would be worked out wherever a brand appears on a questionnaire and the figure inserted which relates to the chosen common denominator. These figures would then be tabulated on a form designed for the purpose and which might be as follows:

Q.3 Frequency of Purchase — *GROUP "Medium"* 1610

Age group	*Period*	*Brand A*	*Brand B*
Under 30	1–3	𝍸 𝍸 𝍸 etc.	𝍸 𝍸 𝍸 𝍸 III etc.
	3–6		
	6–9		
	9–12		
	12–15		
30–50	1–3		
	3–6		
	6–9		

FIG. 12. TABULATION FORM

As in previous tabulations, there would be a separate sheet for each income group. Another possible method would be to have a separate sheet for each brand. In fact the actual method adopted would depend on the exact requirements of the study, and tabulation must be designed to meet these requirements.

From such a tabulation it would be possible to establish a brand table showing the relative quantities of each brand purchased by different classes of respondents by their respective age groups. Brand tables of this kind frequently take the following form.

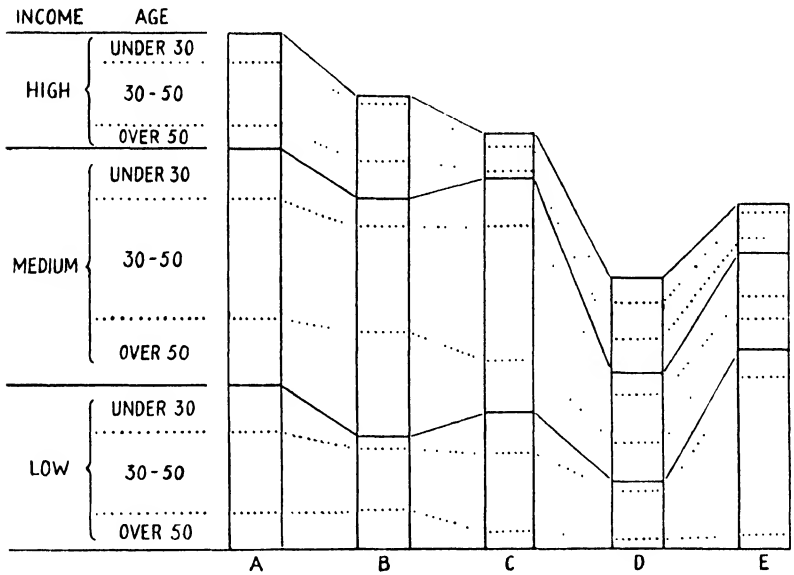


FIG. 13. BRAND TABLE

This chart indicates the quantities purchased for each brand by both income level and age groups. For clarity it is frequently useful to show each factor on separate charts. Tabulation of this kind, instead of indicating the quantities purchased, can also be used to show the amount of money spent, though in doing so the differences due to variations in prices must be shown.

Qualitative Data

Qualitative data, which deals with opinions or reasons for doing things, can be treated in a very similar manner. The main requirement is to establish which are the opinions or reasons most frequently expressed and to relegate those of minor importance to an "others" category.

There are, however, certain other requirements in classifying qualitative data, and these are as follows:

Categories must be mutually exclusive. This is a very important factor and will be readily recognised as such when it is realised that two categories which have the same meaning and effect should be merged into one. For example, when enquiring into the reasons for using a particular brand of tea, replies were given in the following order of importance:

1. Because it is cheaper.
2. It has an excellent flavour.
3. It was recommended to me.
4. It carries a gift coupon.
5. I read the advertisement.
6. A package lasts longer.
7. It is the only tea I like.
8. Other reasons.

In this example reason No. 7 (It is the only tea I like) and reason No. 2 (It has an excellent flavour) both relate to flavour and should be classified under the same heading. The respondents' approach to the question has been different, but in fact their reasons for buying that particular brand are the same.

Categories must be psychologically adequate. In every case there is a basic reason for doing something, but the reasons volunteered by respondents may be superficially extremely varied, though they may all cover the same basic reason. Take, for example, the desire to save money. A respondent may buy an article because it costs less in cash, because it is larger in size and therefore cheaper, because being of better quality it lasts longer or for a variety of other reasons all of which are expressions of the same basic desire to save money.

To get at these fundamental psychological influences and

classify them correctly, it is necessary to visualise the actual concrete situation which results from the actual existence and use of the product and to which they relate. But in all cases these basic influences must be considered in relation to the purpose of the study. Since it may be equally important to ascertain why a product appeals to a person's desire to save money, it is not only necessary to establish the fact that it does but also in what way it achieves this result.

Categories must be logical. This means that no group in a classification should include items of different origin or generality unless, of course, they are so insignificant as to be relegated to an "others" category. Of course, this point emphasises the necessity of determining the fundamental psychological influence behind a qualitative reply.

Asked why she bought a particular product a respondent might reply: "Because I like it." Such an answer from several respondents might, and probably would, conceal a variety of fundamentally different reasons for liking the product, such as flavour, packaging, appearance, size, colour, etc. None of these reasons can be logically placed in one category and such a reply would have to be disregarded during tabulation.

Categories must be pertinent to the study. This requirement is one which is dependent on a preliminary correct definition of the ultimate objective and the intermediate objectives of the study. Obviously, in a survey concerned with discovering women's preferences for various shades of lipstick, a reply relating to the size or shape of the container would not be pertinent, unless specifically catered for by the study, and a category should not be specially set up to cater for it. It must not, however, be forgotten that remarks about the shape and size of the container may be extremely relevant to the marketing of lipstick and should be noted in case a further study should be indicated for the purpose of determining the influence of these factors.

COUNTING

Counting is the last step in the process of tabulation as such; it is simply the determination of the number of legitimate or accept-

able replies which fall into each category. Providing the tabulation has been well planned, the process of counting will be done more or less simultaneously with classification.

As has been seen already, forms would be prepared on which relevant replies would be noted by a single stroke. The system is that vertical strokes are made for up to four replies and the fifth reply is indicated by a diagonal stroke; thus each "gate" (𝍸) represents five replies and it is then a simple matter to count them. A point of importance for the purpose of checking accuracy is to provide a space where worthless replies may be noted to enable the final figures to be checked with the total number of questionnaires.

MACHINE TABULATION

It is not proposed to cover the subject of machine tabulation in this book, but for the sake of completeness it should be mentioned and something said about its advantages and disadvantages over manual tabulation.

There are several machines in general use for this purpose, although the machines themselves are capable of a wide variety of other uses in the keeping of accounting and statistical records. These machines all operate on the punched card system.

These machines operate on roughly the same principle, which is, that data is transferred from the questionnaires to a punched card, each answer being represented by a hole punched in a particular place on the card or by a combination of holes. Once the cards have been punched they are passed through a machine which sorts and counts, according to what is required and how the machine is set, and transfers the results on to sheets. Before this system can be used the questionnaire must be properly coded to enable the information to be readily transferred to the cards, and in many cases the questionnaires are actually coded before the interviewing is started.

Machine tabulation has certain advantages over hand tabulation and briefly these are as follows:

1. Greater speed in tabulation can be achieved.
2. Cross-tabulation is comparatively simple. (Example: brand purchased cross-tabulated by income level.)
3. Increased accuracy by eliminating the human factor in hand tabulation.

There are also some disadvantages involved in machine tabulation and these are:

1. Cost of machines.
2. Day-to-day analysis is difficult.
3. Machines are not elastic and cannot cater easily for out of the ordinary replies.
4. Answers must to some extent be anticipated when preparing the questionnaire. This may lead to the introduction of bias.

On the whole, machine tabulation is an advantage in surveys where questions and answers are simple and where it is a question of recording a mass of simple facts. When it is a question of involved surveys dealing in psychological aspects of marketing problems and having complicated and varied replies, hand tabulation is probably better.

Chapter XIV

ANALYSIS OF DATA

The tabulation of data, as outlined in the previous chapter, will provide a number of facts which have emerged as a result of sifting and counting the mass of collected material represented by the completed questionnaires. Each fact will have a definite meaning of its own which may or may not be relevant to the particular study. On the other hand, it may be necessary to draw further facts from the tabulated material by cross-tabulation.

It is then necessary to establish the relationship of one fact with another and to determine their bearing on the problem. From the very start the whole investigation has been carefully planned with the final objective in view and the tabulated data should contain all the essential facts for the solution of the problem. It is the final analysis of this data which provides the basis for its proper interpretation and for the report on the study.

EXAMINATION AND SELECTION

The first step in the analysis is to examine the already classified material and to select or discard the data according to whether it will or will not be useful for the purpose of the study. The survey will have been designed for a specific purpose and care will have been exercised to obtain the precise data required. It is, however, probable that the various types of data will have different degrees of utility, and in the selection of suitable material it is necessary to examine the data according to certain important factors.

Relevance. In a carefully designed survey for the purpose of establishing certain facts, most of the material should be relevant. This relevance may, however, be affected by the way

in which the various facts emerge. In addition, most enquiries result in a certain amount of incidental information being collected, often of a qualitative or an abstract nature. It is quite impossible to predict people's reactions and preferences; opinions and desires may well be established which had not even been thought of, as well as a quantity of volunteered information. All this material must be carefully evaluated as to its bearing on the problem and selected or rejected accordingly. That which is selected will then have to be given its correct importance.

VALIDITY. The validity of specific data will be dependent on the care with which the various tests have been applied in the planning and the operation of the survey work. At this stage it is necessary to review the tests which were applied to ensure that they are adequate to establish the complete reliability of the final results. The main purpose of this examination is to ensure that there are no data creeping in whose reliability might be in question and which, if taken as proven facts, might adversely affect the accuracy of the findings. Where the validity of information has not been established it should be discarded, or if it appears so important that it must be considered, it should be followed through and verified.

Findings must be borne out by the facts; facts that are established by the survey itself or facts that are already known, possibly as a result of previous surveys. Findings that are contradictory to known facts would put the validity of a survey in question unless and until some good reason can be established for the discrepancy. For example the consumption of commodities revealed by a survey can often be measured against manufacturers' or official figures.

Also, findings must be valid in relation to the size of the sample and its representativeness. For example, in a small sample of 500 respondents, it would not be a valid assumption to say that 35 per cent of A B income groups preferred coffee for breakfast on the basis of the sample alone. The representation of these groups in the sample would be 55 persons, a sample with an error of 20. Similarly the findings of

a survey confined to a specific geographical area are not necessarily valid for other areas.

PRACTICABILITY. It is, of course, possible that while data may be admissible from every point of view, they may have no practical value insofar as the particular study is concerned. Such data, for example, might be the odd twenty or so reasons which occur so infrequently that they are placed together in an "others" category. To list each one separately would merely cloud the issue and this is a real danger unless this fact is recognised. To produce a clearcut report with definite conclusions it is often necessary to be absolutely ruthless in discarding data whose practical value is small. As an aid, it is useful to keep in mind the following three rules:

1. Data must be appropriate to the purpose of the study.
2. Data must be capable of good presentation.
3. Data must have power to convince.

OUTLINE ARRANGEMENT

In most surveys a certain arrangement of material will have been followed throughout. Exactly how material will be arranged finally will depend on the needs of the survey, but at this stage it is useful to prepare a tentative outline for the final report, in which the material is arranged logically.

For this purpose it is useful to prepare loose sheets, one for each subject; this method will enable the order to be changed easily and will avoid crossing out subjects and squeezing others into small spaces. The purpose of such an outline is to focus the mind on every aspect of the problem, and for this reason it must include every possible fact which may have emerged. A useful starting-point in preparing this outline will be the questionnaire itself, because it has been designed to elicit exactly the information that is required.

QUANTITATIVE TABLES

Once such an outline has been prepared it is possible to begin organising the material. Each item in the outline should be

taken in turn and the details extracted from the already classified and counted replies to the questions. The purpose here is to bring the data into an easily useable form. The method of classifying and counting explained in the foregoing chapter will result in a number of work sheets containing the results of the counts, but too unwieldy for commercial use. The analyst is only interested in the results of the counts and these should be transferred to analysis sheets.

A completed analysis sheet applicable to Q.1 illustrated on page 155 (Fig, 10), might be as follows:

Q.1 "Do you use a breakfast cereal?" *Sheet 5*

Age group	*Reply*	*High income*		*Medium income*		*Low income*		*Totals*	
		Count	*Per cent*	*Count*	*Per cent*	*Count*	*Per cent*	*Count*	*Per cent*
Under 30	Yes	30	42	200	38·5	16	40	246	39
	No	41	58	320	61·5	24	60	385	61
30–50	Yes	62	75	600	75·5	72	73·5	734	75
	No	21	25	196	24·5	26	26·5	243	25
Over 50	Yes	24	54·5	121	42	28	58·5	173	45·5
	No	20	45·5	166	58	20	41·5	206	54·5
Totals	Yes	116	58·5	921	57·5	116	62·5	1,153	58
	No	82	41·5	682	42·5	70	37·5	834	42
	Rejects	2		7		4		13	

Note. Percentages worked to nearest ·5% Sample 2,000

FIG. 14. COMPLETED ANALYSIS SHEET

Once all the facts relating to this question have been placed side by side in this manner it is immediately possible to see the differences which occur for the various breakdowns by income groups and age groups. The data have now begun to take shape and to tell a story, and when this work has been completed for all questions, all the material will be ready for the preparation of the report.

From the table it is at once obvious that the use of breakfast cereals is more dependent on age than on income.

In fact, it is in the 30–50 age group that consumption is most pronounced. This is probably accounted for by the fact that this age group represents the majority of parents of growing children. Although this would normally be verified by other data, it is by setting out data in this manner that such facts are shown up.

Analysis sheets can, of course, be very much more complicated than the example given. In a market research survey every distinguishable feature must be studied, and in order to do so it is necessary to break down the data as far as possible. The breakdowns which result may not necessarily have any practical value, but this will not be evident until the actual breakdown has been effected. This process is in fact one of probing and testing all the avenues which lead from the classified data, so that any fact of importance will emerge.

In complicated tabulations it is often more convenient to use several tabulation sheets. For example, in tabulating the data in respect of frequency of purchase by brands given on page 158 it would be convenient to use one sheet for each brand, par-

Question 3 — *Frequency of Purchase* — *Sheet* 8

Brand A — *Interviews* 2,000 — *Units* 15,671

Age group	*High income*		*Medium income*		*Low income*		*Totals*	
	Count	*Per cent*	*Count*	*Per cent*	*Count*	*Per cent*	*Count*	*Per cent*
Under 30	276	7·4	520	13·9	197	5·2	993	26·5
30–50	301	8·0	1,027	27·4	351	9·4	1,679	44·8
Over 50	312	8·3	610	16·2	157	4·2	1,079	28·7
Totals	889	23·7	2,157	57·5	705	18·8	3,751	100·0

Brand A Percentage of total 23·9

FIG. 15. BRAND ANALYSIS SHEET

ticularly as in this case the tabulation would be followed by showing the data on a bar graph.

For purposes of comparison it is necessary to break down the counts into percentages. It is, however, important that the percentages should be related to the factor it is desired to study. In the example given on page 167 (sheet 5) there would be little point in working percentages vertically, as this would merely show the proportions of each age group in the various income groups, a fact which would be brought out elsewhere. The percentages would therefore be more useful if they show within each breakdown and each total the proportions answering "Yes" or "No". In the example on page 168 (sheet 8) it would be more useful to show percentages which relate to the grand total of brand A units consumed.

This table shows the percentage values of each breakdown applicable to brand A. Similar tables are worked for the other brands, but although they can if necessary be combined in one table, it is usually more convenient to use separate tables. If it is necessary to study other features connected with the frequency of purchase of brands, the figures can readily be extracted from the existing tables.

GRAPHICAL PRESENTATION

Graphical presentation is used in market research both for conciseness and for dramatic effect. It must be readily admitted that there are few situations which cannot be easily described in the normal written text. But if a situation, particularly one which involved a mass of quantitative data, is submerged in words, it will be difficult to understand, lengthy in description and will fail to impress.

A graph is, on the other hand, much more dramatic a method of presentation and one which contains the essential facts in a small space and is easily understood. Imagine the effect of the graph overleaf on the average sales manager.

Although this graph shows steadily increasing factory sales it also shows a heavy decrease in dealers' sales to customers from September onwards. Dealer stocks are piling up and unless immediate action is taken there will be severe repercussions on

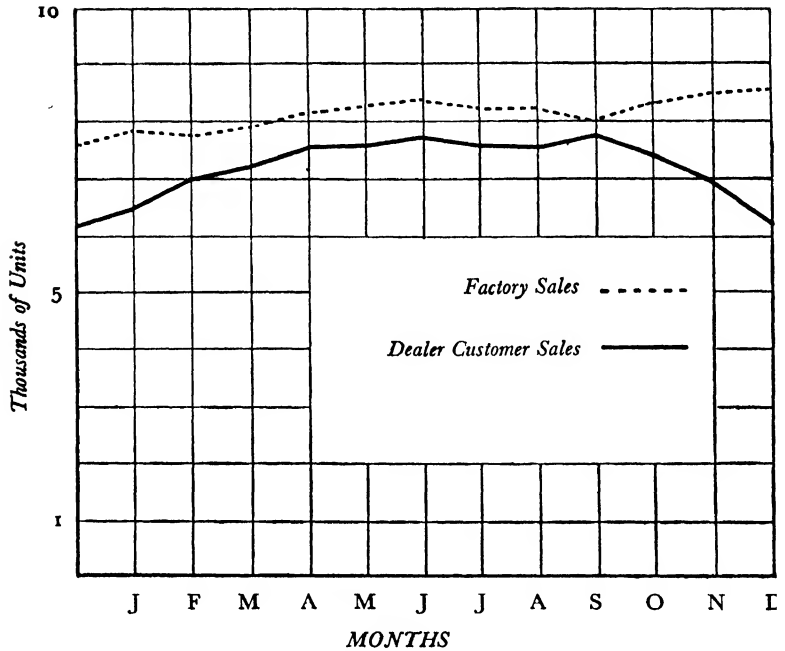


FIG. 16. SALES GRAPH

the factory in a month or two. Here the whole situation has been presented clearly and with dramatic force; this could not have been achieved by written text alone.

Every feature of a market study cannot, of course, be presented graphically and it is a matter of careful discrimination to determine which features should be presented in this fashion. As a general rule points which are of real importance or which, if left in the written text, may be overlooked, should be presented graphically.

There are various methods of graphic presentation. Where ordinary graphs are used, such as that in figure 16, it is a matter for decision whether the various relationships between the various factors should be shown by using one curve only or several. Similarly, whether one or more graphs should be used for related factors. This will usually be decided by whichever method will make for clarity of presentation.

A very common form of graph used in market-research studies is that which is known as the bar graph. This type of graph is particularly useful for presenting data of the nature of that shown in Fig. 15 (sheet 8). The method is to draw for each set of data a rectangle standing on its narrow side, which is divided to scale according to the data itself. The "bar" representing the data in Fig. 15 (sheet 8) would be as follows:

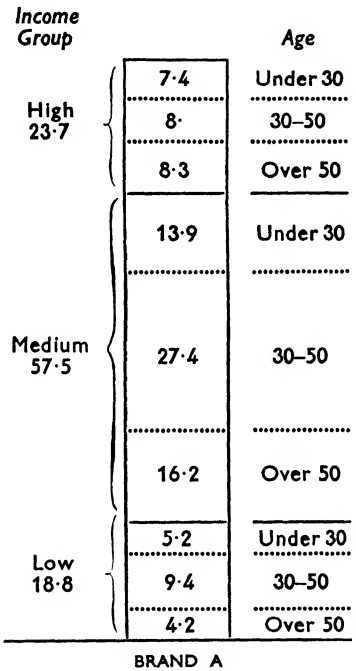


FIG. 17. TYPICAL BAR GRAPH

This "bar" shows the data for brand A only and similar bars would be constructed for the other brands. They would all be finally combined into a single graph such as that shown in Fig. 13. It is an advantage to use a large scale for such graphs, particularly, as in this case, where the bars are joined by lines to show the corresponding divisions of the various bars. A large scale also enables the percentage figures to be clearly inserted.

QUALITATIVE DATA

Qualitative data, which can be measured quantitatively, can be presented in a similar manner to pure quantitative data. Every study will, however, produce qualitative data of a kind which cannot be treated in this manner and which require a different form of treatment.

The value of this kind of data depends largely on its source. Obviously information volunteered by a high executive of a department store would be more likely to be more carefully thought out and of greater value than that volunteered by the proprietor of a suburban grocer's shop. It is, of course, necessary to try and discover the motive behind such volunteered information, and even if the information is heavily biased, as is often the case, it will often in itself be a valuable pointer, particularly if the motive can be established.

For example, if a top executive of a large multiple concern were to volunteer the information that he carried a particular brand of a food product, because he was sometimes asked for it, but that he sold little of it because his own brand was cheaper, the motive would probably be not far to seek. Low sales of the brand could almost certainly be ascribed to the fact that he did not push this brand because his own brand showed him a larger profit, but the very fact that this information was volunteered in this way would be of value to the manufacturer.

Information of this kind cannot be treated statistically nor can its accuracy be assessed, but it is often worth high-lighting. This should not, however, be done in the body of the report, but a comprehensive account of the information and the circumstances under which it was acquired can be usefully included in an appendix.

SIGNIFICANCE OF DIFFERENCES

When the same question is asked of two different groups of people it is frequently necessary to establish whether the difference in the percentages of each group giving the same answer is due to the fact that the groups are different, since this

may be an important factor in the particular study. The question is whether the difference in the percentages is a real difference due to there being some factor at work which makes the two groups react differently or whether the difference is one which is due to chance errors of sampling. If the difference is a real one, it is said to be significant.

For example, if the question "Do you have coffee for breakfast?" were asked of two groups consisting of 1,100 respondents in the high income groups and 9,100 in the medium income groups, the answers might be as follows:

High income groups	Yes 55 per cent.
,, ,, ,,	No 45 per ,,
Medium income groups	Yes 35 ,, ,,
,, ,, ,,	No 65 ,, ,,

In this case the standard errors, using 3σ, are respectively 4·5 and 1·5, so that the true proportions who have coffee for breakfast are contained between the following limits:

High income groups 50·5 to 59·5
Medium income groups 33·5 to 36·5.

The lowest limit for the high income groups and the highest limit for the medium income groups do not overlap, and there is, therefore, a true difference.

In such cases where the differences are large, the fact that the difference is real is comparatively easy to establish by the method shown here. When, however, the limits overlap, the difference may still be significant, but the method of computation is dependent on the standard deviation.

The significance of the difference is established by using the formula $\sigma_1^2 + \sigma_2^2 = \sigma_d^2$, where σ_1 is the standard deviation of the first group and σ_2 the standard deviation of the second group. σ_d is the standard deviation of the difference.

Supposing that the results of a survey show that the percentages of the two groups giving an answer "Yes" are as follows:

Group A (1,600) "Yes" 20 per cent
Group B (2,400) "Yes" 40 „ „

The difference between the two groups is 20 per cent. The standard deviation is 3 in each case. Using the formula, we have:

$$3^2 + 3^2 = \sigma_d^2$$
$$9 + 9 = \sigma_d^2 = 18$$
$$\sigma = \sqrt{18}$$
$$\sigma_d = 4{\cdot}24 \text{ (approximately).}$$

As three standard deviations have been used it will be necessary to take three times σ_d or $(4{\cdot}24 \times 3) = 12{\cdot}72$. Since the actual difference, 20, is greater than 12·72, it is a real difference and it can safely be said that there is some factor at work to which this difference can be attributed. If the difference were less than 12·72, it could be attributable to chance errors of sampling and would not, therefore, be significant.

It must be noted that σ_d must be multiplied by a factor equivalent to the number of standard deviations used in working out the sample error. If 3σ are used, then σ_d should be multiplied by 3, as in the example; if 2σ are used, then σ_d should be multiplied by 2, and so on.

CORRELATION

Correlation is the measure of the dependence of two or more sets of numbers one upon another. It is obvious that these sets of numbers must be variables. For example, the distance flown by an aeroplane and the amount of petrol consumed will have a very close relationship, the one being dependent on the other.

Perfect correlation is expressed by the figure 1. Where no correlation exists, this is expressed by the figure 0. Intermediate figures represent various degrees of correlation. In market research it is seldom if ever that a perfect correlation can be established, and a correlation of ·80 is considered a very high degree of correlation.

In market research three kinds of correlation can be distinguished:

1. *Positive correlation*, where one variable increases in direct proportion to the increase in another variable. (Perfect positive correlation would be expressed by + 1.)
2. *Negative correlation*, where one variable decreases as another variable increases. (Perfect negative correlation would be expressed by − 1.)
3. *Multiple correlation*, where several variables combine to affect another variable.

There is no intention here of describing the mathematical calculations which are used to establish whether or not correlation exists. These methods are explained at length in the appropriate text-books and have no place here. The market-research man must, however, know what correlation is and how it affects him in his work.

A word of warning, however. Two given factors may show a high degree of similarity in their variations; this does not necessarily mean that correlation exists and that the variation of one factor is dependent on the variation of the other. It may well be that both factors are influenced by a third factor which affects them both to the same degree.

The analyst should never entirely rely on the obvious mathematical conclusions and it is his responsibility to use a high degree of common sense in assessing these conclusions and giving them their true value. Unless he does so, some quite fantastic conclusions may result.

For example, if the rate of wear of a car engine and the car tyres were measured it would probably be found that a high degree of correlation existed between the wear of the engine and the wear of the tyres and it might be concluded that the one was dependent on the other. It would not require much thought to realise that both were due to a third factor: to the fact that the car was being used.

Although it is not proposed to enter into a description of the mathematical procedure used to establish the correlation which exists between two or more factors, it is appropriate to mention here a method which is recommended in *The Technique of*

Marketing Research, issued by the American Marketing Association, and it is here quoted in full:

"In most marketing problems, it is not necessary to have an exact mathematical measurement of the degree of correlation between two or more time series, and for these cases the following simple expedient is recommended. The various time series are plotted on graph paper, each on a separate sheet. The dependent variable, that is, the time series which is presumed to be influenced in its variations by one or more factors, is plotted on heavy paper, and the factors whose influence is being studied are plotted on transparent sheets of plotting paper. By placing the thin sheets over the heavy sheet, one at a time, the correspondence of the dependent variable with each of the factors can be judged by eye. This method is particularly useful in observing a time-lag, which is done by shifting the transparent graph paper from left to right until the curve on the transparent paper corresponds best with the sheet underneath.

"Even simpler than this is the very common method of plotting several curves on the same sheet, superimposed upon one another, on the same time-scale. Inspection by eye frequently gives all the information that may be necessary.

"The graphical method of plotting curves for comparison is almost indispensable to a clear grasp of a situation. Even when correlations are to be computed mathematically, the curves should be plotted, anyway, if only for the purpose of obtaining a visual concept of their relationship.

"A basic necessity in all marketing studies is that the investigator 'keep his feet on the ground' at all times, understand the practical significance of every step in his analysis and interpret every mathematical conclusion in terms of the realistic problem at hand." [1]

SIGNIFICANCE BY CORRELATION

Having explained the meaning of correlation, it is now possible to show how it is used to determine whether the difference is

[1] Reproduced by permission of the American Marketing Association.

significant when two groups of people are not independent. For example, in a survey concerned with brand preferences, if the sample contained a high proportion of people who said they preferred brand X it would be likely to contain fewer people who said they preferred brand Y, than another sample where fewer people preferred brand X. If the proportion of the people who say they prefer brand X and those who prefer some other brand are respectively P_1 and P_2, the formula used to establish significance is:

$$\sigma_d^2 = \sigma_1^2 + \sigma_2^2 - R P_1 P_2$$

where R is the correlation between the two proportions P_1 and P_2, or, in other words, the measure of the extent to which these two proportions are dependent on each other. In market research this formula will be generally used in questions of brand preference and similar questions, where the respondent has a limited number of alternatives to choose from.

In these circumstances the value of R can be shown mathematically to be $-\frac{2}{n}$, where n is the size of the sample. From this fact the complete formula which is used for brand preference and similar limited choice questions becomes:

$$\sigma_d^2 = \sigma_1^2 + \sigma_2^2 + \frac{2}{n} P_1 P_2$$

Thus supposing that in a survey designed to establish brand preferences, in a sample of 3,600, 20 per cent say they prefer brand X and 10 per cent say they prefer brand Y, the standard deviations would be as follows:

Brand X 20 per cent and 80 per cent some other answer

$$\sigma_1 = 2.$$

Brand Y 10 per cent and 90 per cent some other answer

$$\sigma_2 = 1{\cdot}5.$$

The question is: Is the difference of 10 per cent between these two brands a real difference or one which may be due to errors of sampling ?

From the formula we have:

$$\sigma_d^2 = 2^2 + 1{\cdot}5^2 + \frac{2}{3600} \times 20 \times 10$$

$$\sigma_d^2 = 4 + 2{\cdot}25 + {\cdot}11$$

$$\sigma_d^2 = 6{\cdot}36$$

$$\sigma_d = \sqrt{6{\cdot}36} = 2{\cdot}52$$

Since, in this case, 3 standard deviations have been used it is necessary to take $3 \times \sigma_d$, thus:

$$3\sigma_d = 3 \times 2{\cdot}52 = 7{\cdot}56$$

Since the actual difference 10 is greater than $3\sigma_d$ or 7·56 the difference is a real difference and, therefore, significant.

SELECTION OF MATERIAL FOR REPORT

Not all the data collected during the course of a survey are suitable for inclusion in the final report, and even at the stage when the analysis has been completed there will still be a certain amount of elimination and selection to be done. It is usually a good plan to review the material once the more technical aspects have been completed and the data are ready to be assembled in the form of a report.

When data are being selected in this way for assembly into the final report, the criteria for selection are as follows:

In Relation to the Purpose

At the very beginning it will be remembered that it is necessary to define the purpose before any study is begun. That is, the use to which the findings of the study are to be put. If the purpose has been borne in mind throughout the work, every step will have been directed towards it and most of the data collected will bear directly on the purpose of the study.

Inevitably, however, a certain amount of material will have been collected which will have no bearing on the purpose of

the study, or which taken together with other material will be found to be unnecessary. It is essential that the data to be used in the report stage should all tend to disclose the truth of the particular marketing situation and any data which does not help to do this can usually be ignored.

This question of truth is most important and is not altered by the fact that data are favourable or unfavourable to predetermined conclusions. A research man must, if nothing else, be entirely objective and incapable of nurturing preconceived ideas.

In Relation to Its Importance

Material should be set up in its order of importance. When unnecessary data have been eliminated, those which remain will not all have the same degree of importance. For this task some knowledge of marketing is essential since the importance of the various data in relation to the purpose of the study must be determined.

The questions to ask one's self are: "What is the most material fact which has emerged from the study?" Then: "What facts have a direct bearing on this one fact?" After this comes: "What is the next most important fact?" and so on. The object here is to avoid clouding the salient features by over-emphasising the features which are of lesser importance.

By having due regard to the relative importance of the facts which emerge as the result of a marketing study, that action which is most necessary to achieve the purpose for which the study was undertaken will be clearly indicated to the readers of the report who will be responsible for executive marketing decisions.

Chapter XV

INTERPRETATION AND REPORT

Analysis and interpretation are two stages in market research which are so closely linked that it is sometimes difficult to say exactly where the one ends and the other begins. It is almost inevitable that a considerable amount of interpretation is carried out as part of the analysis and sometimes even it becomes an essential part of it.

Analysis involves a detailed study of the collected data to discover what facts and what ideas emerge from them; in fact it is the process of determining just what the data mean. Experimentation is necessary in analysing the data. It is necessary to formulate hypotheses and then test them against the data. This is an essential part of analysis, but it is important not to confuse hypotheses with conclusions.

Interpretation has basically two elements, the first consists of correctly relating the findings to the requirements of the problem which is to be solved. This is most important, because any amount of data will be useless unless it can be shown how they bear on the immediate problem. For example, a lengthy discourse on the structure of steel would be of little use to the man who was looking for a nut to fit a bolt, although it may be of great interest to the manufacturer of the nut and bolt. It is essential to keep to the point, and in interpreting data the link between the discovered information and the problem must be sought and found.

The second element of interpretation consists of translating the technical jargon of the research worker into the commercial jargon familiar to the prospective reader. The ideas of a research worker are often technical to the layman, the man who is going to take action on the basis of these ideas. They

must, therefore, be recast in a form with which he is familiar and which he will readily understand.

Analysis is the process of taking apart the data to see what they are worth, while interpretation involves their reassembly in a form which is logical and which will reveal their true significance. Together these two processes will reveal the significant and penetrating relationships of the collected facts which will lead to the formulation of conclusions. It is the formulation of conclusions which is, of course, the ultimate goal of research.

APPRAISING THE FACTS

At each stage of the research process it has been necessary to stop and examine what has so far been done. At the beginning this examination leads to the setting up of further intermediate objectives; during the course of the field work the collected material is examined to evaluate progress and determine whether the requirements of the problem are being met. During the editing, tabulation and analysis, the material is examined and sifted. When the stage of interpretation is reached the collected facts must be appraised and their value in relation to the problem and in relation to each other determined.

The significance of each elicited fact must be determined in relation to the object of the work. This means that the exact meaning of each fact must be clearly established and then tested against the objective to see whether it has any bearing on it. And again one fact must be related to other facts since although it may not be very significant by itself it may assume a new significance in its relationship to other facts.

The importance of each fact must also be correctly related to the objective and all facts then alligned in the order best calculated for clarity of exposition. Quantitative and qualitative data will already have been subjected to tests of reliability and should be acceptable on this score; they need, however, to be correctly related to the problem at hand so that their true value can be appreciated.

SETTING UP TENTATIVE CONCLUSIONS

From an appraisal of the data general impressions will emerge automatically which will be in the nature of conclusions. From these impressions it will be possible to set up tentative conclusions to be proved or disproved by the assembled data. Generally one or two features will stand out and they usually are the most important features of the study, they become the main conclusions in the report which the subsidiary conclusions will tend to support.

It is thus necessary at once to segregate the separate ideas that emerge and integrate them into a comprehensive conclusion. For example, on the basis of the data from a survey it may be overwhelmingly evident that the reason for a drop in sales is the fact that consumers' preference has changed to other brands. This becomes a main conclusion, but to support it subsidiary conclusions will be concerned with the reasons for this change in preference. Singly, each reason may be relatively unimportant, but integrated to show their cumulative trend their true importance emerges.

There may be a second major conclusion to the effect that purchasing power has declined. Coupled with the first conclusion this would bring out a third conclusion that the product concerned is losing ground for two reasons: a general decline in trade, and because of the encroachment of one or more competitors.

Simple statements of fact are not enough by themselves and it is usually necessary to relate them to other facts. For example, the simple statement that one million cars over fifteen years of age, and, therefore, requiring early replacement, were on the road, would not be sufficient to estimate future demand for cars. Further facts would be necessary to show how many of these car owners would in fact be in a position to buy new cars; how many people would run their present car until it was beyond repair and then give up motoring altogether, or purchase another second-hand car.

In this way conclusions must be tentatively set up for the purpose of integrating the outcome of the study as a whole.

This forms the basis of the interpretation, but it must be a flexible basis and if any conclusion is found to be unsupported by fact it should be discarded without hesitation or modified in the light of those facts, and for this purpose it is necessary to give every tentative conclusion a thorough testing.

TESTING TENTATIVE CONCLUSIONS

Testing is a process which is necessary at each stage in survey work, but perhaps the testing of conclusions in the process of interpretation is even more vital, because it is on these conclusions that executive action will be taken. Generally there are four tests which can be applied.

AGAINST THE FACTS. This is the first and obvious test to make sure that the facts do support the conclusions arrived at. This test comprises the following points:

1. Whether the supporting data is adequate.
2. Whether any factor has been overlooked.
3. Whether there are any inconsistencies.
4. Whether there is any element of bias in the conclusions.
5. Whether conclusions are genuine and not preconceived.
6. Whether the correct value has been given to each fact.

AS EXPLANATIONS OF FACTS. The purpose of arriving at conclusions is to explain the proven facts; one test is, therefore, to determine whether or not the tentative conclusions do actually and sufficiently explain the facts. There may be facts which have been overlooked from this point of view and which require explanation, or others to which explanations have been given which are unnecessary or which have been given an undue importance.

BY COMMON SENSE. Cold logic or common sense is perhaps the most valuable test for any conclusion. If the interpreter asks himself whether the particular conclusion sounds reasonable, and he must give himself the answer "No", or he is doubtful, then he must find out on what basis this conclusion has been arrived at. It happens quite often that seemingly far-fetched conclusions are conclusively proved to be true. For

example, it might be surprising to find that a number of lower-income-group households, where the husband averaged fifty years of age, could afford television sets. But by checking the returns and finding that these households averaged two or three grown sons and daughters of working age, this fact is no longer surprising.

Frequently, however, absurd conclusions are drawn from data which have an inadequate statistical basis. For example, where a really complicated breakdown is operating, a conclusion might be based on a group of twenty-five respondents, ten of whom prefer a particular brand. It would be manifestly absurd to conclude from this that 40 per cent of the population had this brand preference, since it would not be possible to determine this from a sample with a possible error of nearly 30 per cent. Survey reports have even been known to base conclusions on a *single observation.* Without thinking very hard about it, it is immediately obvious that a single observation can give practically any answer.

By Trying Alternative Possibilities. This is an attempt to prove other possible conclusions and is in this sense a negative test. In other words, if all possible alternative conclusions have been tried and none of them is tenable on the basis of the collected data, then the original conclusion, being the only tenable one, must be correct.

FORMULATING FINAL CONCLUSIONS

When the conclusions have been thoroughly tested and still found tenable, they can then be formulated as the conclusions resulting from the research. This is, of course, the final goal and once the conclusions are known it only remains to write up the data with their conclusions in the form of a presentable and interesting report.

It is, however, necessary to review once again the objectives of the study and relate them to the final conclusions arrived at. Are these conclusions, in fact, what is required to solve the particular problem or clarify the particular situation? Will it be possible to fully achieve the purpose of the study on the basis

of these conclusions? These are questions which should be asked at this stage.

These conclusions must also fully reflect the marketing conditions disclosed by the study. Nothing must be overlooked, that is, nothing which is material to the purpose. Every circumstance must be given its correct value and neither emphasised nor belittled, and certainly no unfavourable material fact must be omitted, or shown in such a way as to cloud its true significance. The aim of these conclusions must be exactly what is required of a witness in a court of law—to tell the truth, the whole truth and nothing but the truth.

THE REPORT

The report is not all that the sponsor of a marketing study pays for though it may be all he sees: he pays for the work which has gone into the study and made the report possible. The report must therefore truly reflect this work and the care that has been exercised throughout the study. It must also be presented in such a way as to be easily understood by its readers and to make it easy for them to grasp its purport.

It must not be forgotten that the average reader is a layman to whom it is necessary to present technical ideas. This means that the writer must not only be conversant with the techniques of market research, but he must also be an expert in the art of putting over technical matters to the inexpert. He must teach without the appearance of teaching. He must have the knack of imparting knowledge in an interesting manner so as to hold attention and he must be able to use words convincingly.

Market-research reports are generally based on the Sorbonne method of reporting and are normally in four parts, namely:

1. Introduction and explanation of the problem.
2. Conclusions and recommendations.
3. Body of the report.
4. Supporting material and appendices.

Each part of the report will be further broken down into sections covering the various aspects of the work and within this frame-

work there is scope for variety in presentation since the requirements of individual studies will vary. In general, however, the outline of a report is as follows:

1. *Introduction and Explanation of the Problem*

A. *Title page.* The presentation of the title page is most important because it is the first part of the report which is seen and has, therefore, the task of selling the report in the first instance. A report is more likely to succeed if the first impression is good than if it is bad. The title should be as concise as possible, but at the same time it must be complete. A typical title would be as follows:

REPORT (1)
on the
MARKETING POSITION (2)
of
"TEX" HOT WATER BOTTLES (3)
in
THE HOME COUNTIES (4)

Notes

(1) Says what it is.
(2) Says what it is about.
(3) Gives the special interest involved.
(4) Says where it was carried out.

In addition to the actual title, the title page should say for whom the report was prepared, by whom the work was carried out and should give the addresses of both parties as well as the date of publication.

B. *Index of contents.* All pages in the report should be numbered and properly indexed at the beginning of the report for easy reference.

C. *Acknowledgements.* If any material has been obtained from published sources, it is mere courtesy to acknowledge the fact. Similarly, any special assistance received from individuals of organisations should also be acknowledged.

The right place for this is a special page immediately following the index.

D. *Description of the problem.* The problem should be briefly described and its salient features brought out. The reason for this is that a market survey takes some time to complete and it is necessary to remind the reader of the exact nature of the problem so that his mind will be in tune with the situation and he will more readily grasp the significance of the report itself.

E. *Purpose and scope of the study.* The purpose and scope of the study as decided from an analysis of the problem should be outlined to show how the study has been related to the requirements of the problem.

F. *Method employed.* The method employed depends on the purpose and scope and should be briefly outlined so that a clear picture can be formed of how the conclusions have been reached without the necessity of a detailed description of complicated methodology.

2. *Conclusions and Recommendations*

Although it may appear more logical to reserve the conclusions and recommendations for the end of the report, it is in fact more practical to place them at the beginning. It must be remembered that a managing director or board of directors will be more interested in the conclusions and recommendations than in the way in which they have been arrived at. If support for any particular item is required it can be obtained by referring to the appropriate section in the body of the report. What the top-level executive in fact requires should be included at the beginning of the report and provided the problem, purpose, scope and method are convincingly described and are followed by clear and well thought out conclusions and recommendations, the top-level executive need not wade through the detail and can leave this task to subordinates.

3. *Body of the Report*

A. *Analysis of the problem.* In the body of the report the analysis of the problem is developed in detail showing how the

purpose of the study has been determined and the natural sequence of intermediate objectives and final objectives.

B. *Analysis of method.* In this section the purpose is to show the development of the method. The sequence of action should be explained and the details of the method by means of which the work was carried out.

C. *Findings.* The findings of the study are here again given in detail to show how they have led to the development of the conclusions and why those conclusions are sound. The supporting arguments for the recommendations should be included and alternatives should be analysed and evaluated.

The body of the report will, of course, be by far the largest part of it. There is no room for summaries here, and the complete procedure and sequence of events should be described from the inception of the study and the analysis of the problem right through the work of collection and analysis of data and the methods employed, to the framing of conclusions and their supporting arguments.

4. *Supporting Material and Appendices*

A. *Statistical tables.* To include the statistical tables showing the analysis of replies in the text would break up the text of the body of the report to such an extent as to make it difficult to read. Although the findings shown in the tables are generally described in the body, the detailed breakdowns should be collated separately.

B. *Charts and graphs.* The same principle applies to the use of graphs and charts, though in a number of cases it will be found useful to show some salient features graphically in the body of the report or even in the conclusions.

C. *The sample.* The general characteristics of the sample will have been clearly described in the body of the report, but its detailed distribution should be given separately in this final section.

D. *Appendices.* These consist of such things as maps, diagrams of products, plans and other items which are included to lend weight to the arguments or for interest.

The whole make-up of the report must be essentially logical, and to grasp how the above framework achieves this purpose it is useful to consider what happens to a report when received by the sponsoring concern. First of all top management which is responsible for marketing decisions wants to know the results. Top management has no time to wade through the detail and therefore needs two things:

1. To refresh its memory on the nature of the problem itself.
2. To have conclusions and recommendations which are reliable and on which decisions can be taken.

These two requirements are provided by the brief introductory part and by the second part containing the conclusions and recommendations.

Once top management is satisfied, the report will be passed on to the sales manager and his department who will digest the body of the report and extract all information which will be useful in the work of that department. It is unlikely that the sales manager will also be a statistician and he will therefore leave the statistical material to be dealt with by his records and statistics department.

A WORD ABOUT RECOMMENDATIONS

There is a certain amount of controversy about whether it is the duty of the researcher to make recommendations or not. In this respect the researcher is in the same position as a Committee or Royal Commission set up to study a particular problem. Logically, the man who has made a deep and detailed study of a problem is in the best position to recommend the steps which will lead to its solution.

It is, however, necessary that in order to make recommendations the researcher should not only understand the techniques of market research but should also have an adequate knowledge

of marketing the particular product with which he is concerned. If he does not understand all the factors involved, he should confine himself to producing a clear interpretation of the findings and the necessary conclusions from which someone else, who is more conversant with the special marketing problems, can make the right recommendations.

Whether or not recommendations are eventually produced depends of course on whether they are asked for by the person who commissions the work. In cases where a research organization is merely asked for a statistical table showing certain information, then neither conclusions or recommendations are called for since only the bare facts are required and presumably the sponsoring concern has a staff qualified to deal with them.

Chapter XVI

METHODS OF ENQUIRY IN SURVEY WORK

In the interests of simplicity the discussion in the foregoing chapters has centred round straightforward surveys which are designed as single studies for a specific purpose, and which are unconnected with any of the more involved special techniques; and it has been assumed that the work is being done by the more widely known method of personal interviewing. For the sake of completeness it is now necessary to consider the various methods of obtaining information, with their relative advantages and disadvantages.

1. POSTAL METHOD OF ENQUIRY

Although widely adopted in the U.S.A., this method has so far found less favour in the United Kingdom. The reason is probably one of geography. In a much smaller country with a very much more concentrated population like the U.K., some of the advantages of the postal method become less pronounced.

In the postal method the sample is built up in the normal manner and a mailing list is prepared. The questionnaires are then despatched together with a covering letter explaining the purpose of the study and asking for the respondents' co-operation. Usually a pre-paid reply card or envelope is enclosed.

Advantages

1. *Low cost.* The postal method is claimed to have the advantage of cheapness. Although theoretically this is true, it is not so of all postal enquiries. The assumption of low cost is based on the fact that for the cost of a stamp the required information can be obtained, and this is set

against the cost of maintaining an interviewing staff in the field. If the body of respondents belonged to a universe which was so selective that virtually all would reply, this would in fact be so. It seldom happens in practice, however, that the response exceeds from 5 to 10 per cent of the mailed questionnaires, and if the comparison is made on the basis of the returns obtained and the other disadvantages of the technique, the real cost becomes more apparent.

2. *Wide distribution.* Where it is necessary to cover a very wide area or to reach a highly selective but widely scattered universe there is a distinct advantage in the method. If the survey, in such cases, were carried out by personal interview, the travelling costs of interviewer would be prohibitive.
3. *Speed.* Another advantage of the postal method lies in the speed with which the replies are received. In the ideal case, all the respondents would be completing their questionnaires at the same time and they would all be returned within a few days. In practice, however, it is usually necessary to send several reminders and even to carry out a certain number of personal interviews among those, who do not reply.
4. *Ease of reaching a specific class of people.* When it is a question of reaching a special type of person, the postal method can be used to advantage. It might, for example, be used to contact amateur photographers where the difficulties of personal interviewing would be considerable. Similarly, some people are not ready to grant interviews, although they would be prepared to fill in a questionnaire.
5. *Eliminates interviewer bias.* This is indeed a real advantage. One of the problems most difficult to solve is the possibility of the interviewer's personality affecting the answers to a questionnaire, either because he directly influences the respondent by his manner or because he subconsciously introduces a bias by his wording of the answers.
6. *Anonymity.* In a postal enquiry the respondent remains anonymous, there is no need to indicate his identity on the

reply sheet, and for this reason he is likely to be more frank in his replies. It is a natural tendency for people to put on a "show" when talking to strangers, but in the impersonal completing of a form this tendency is much less pronounced.

Disadvantages

1. *The problem of non-replies.* This is perhaps the most serious disadvantage of the postal method. If we ask ourselves why the 5 or 10 per cent who have answered have in fact done so, it is reasonable to assume that it is because they were more interested than the remainder, and for that reason they would be a biased segment of the original sample. Increased replies can be obtained by despatching reminders, but there will always remain a proportion who do not answer. The only way to find out why these people have not answered and what kind of people they are is to interview them personally, or at least a sample of them. This will, of course, considerably increase the time required and the cost of the survey.
2. *Unrepresentative mailing.* Another serious problem is that of obtaining a representative mailing, particularly where a large universe is concerned. It is, for example, impossible to obtain a complete list of British housewives. On the other hand, when dealing with a special segment of the population, such as telephone subscribers or doctors, this problem does not arise.
3. *Length of the questionnaire.* Few people are willing to sit down and reply to a long questionnaire received through the post. The questionnaire must, therefore, be short.
4. *Ambiguity.* In postal enquiries there is no interviewer to ensure that questions are properly understood and properly answered. There is, therefore, always a danger of the respondent misunderstanding questions or giving ambiguous replies. To avoid this as much as possible, questions must be kept simple.
5. *Classification of respondent.* Since the respondent is neither seen nor known it is impossible to know for certain how to classify him. He may be asked to state this in the question-

naire, but there is no means of knowing whether his answers are true, as there is in personal interviewing, by observation. This means that the respondents' answers must be accepted and the risk of untruthful replies accepted or no attempt at classification can be made.

These, then, are the advantages and disadvantages of the postal method of enquiry, and although it may appear to leave much to be desired from the scientific point of view, it must be said in fairness to the method that it is often the only practical means of obtaining the required information, particularly when the universe consists of widely scattered people, or is one which is closely defined by special characteristics.

2. THE TELEPHONE ENQUIRY

The telephone method of enquiry is widely used in the United States in connection with the measurement of radio audiences. Although this particular use is not applicable to the United Kingdom in the same degree, because radio is not used for advertising in this country, it is still a method which can be used for certain types of enquiry. It must not be forgotten, however, that it is restricted to telephone subscribers and where the universe extends beyond the telephone subscribers, it is unsuitable.

Advantages

1. *Simplicity.* The method is extremely simple. The interviewer only needs to have a list of telephone numbers, previously selected as the sample, a pad of "blank" questionnaires and a good telephone personality. Everyone has not the same telephone technique, and an interviewer who may be outstanding as a door-to-door man may fail completely on the telephone. This matter of telephone personality must therefore be given some consideration.
2. *Rapidity.* Speed in interviewing is a major advantage of this method. A good interviewer can make as many as ten calls an hour.

3. *Low cost.* The telephone method is also low in cost mainly because of the speed with which a good interviewer can operate and the low cost of telephone calls provided they are local ones. A man sitting in London could cover all metropolitan subscribers at twopence a call.
4. *Ease of obtaining a random sample.* Another advantage claimed for this method is the ease of obtaining a random sample. Given in the first place that the list of telephone subscribers is itself representative of the desired universe, it is only necessary to take every *n*th name in order to build up a completely random sample.
5. *Ease of interviewing the top-income bracket.* Many people who would not be prepared to grant interviews do not mind a short telephone conversation. This is particularly true of high-income-group housewives, who are protected by maids and top-level executives who are protected by secretaries. The telephone is often the only means of reaching these classes of people.

Disadvantages

1. *Unrepresentativeness of list.* This disadvantage has already been touched upon. For a truly representative sample to be selected, the original list must itself be either a list of the entire universe or a completely representative selection of that universe. It is only where the list of telephone subscribers fulfils either of these requirements that a telephone survey can be safely used.
2. *Difficulty of rural areas.* In rural areas the high cost of toll or trunk calls added to the increased time required to make a call considerably reduces the advantage of low cost. In addition, in many country districts where one line serves a number of subscribers, telephone conversations soon become public property, and, should this occur, not only would future respondents prepare their answers in advance, but all respondents would be loathe to broadcast their private business over the telephone.
3. *Lack of time.* It is obvious that in a telephone interview the conversation must be kept short and questions simple.

Questions which require long and complicated answers cannot be asked. This disadvantage becomes accentuated in toll and trunk calls by rising costs for long conversations.

4. *Limitation on questions.* Questions which are of a personal nature or otherwise intimate cannot be asked.

Although the telephone survey will be suitable in certain specific instances, it is not of such universal applicability as the method of personal interviewing, which is considered next, or even the postal method.

3. THE PERSONAL INTERVIEW METHOD

Advantages

1. *Control of sample.* By using the method of personal interview it is possible to exercise a much greater degree of control over the make-up of the sample. Its characteristics will have been determined beforehand and very definite specifications for the selection of respondents will have been laid down according to the method of sampling. Once all returns are in, it will be possible to determine whether the sample accurately corresponds to these specifications, but by careful supervision this can also be controlled during the actual process of interviewing.
2. *More reliable answers.* Although answers may be equally accurate whatever the form of interviewing, when personal interviewing is used there is a much greater degree of certainty of their accuracy, because the investigator can eliminate misunderstandings at the time they occur, and probe the mind of the respondent until he is satisfied with his answer.
3. *Longer questionnaires.* When the interview is done personally the questionnaire can be much longer and the questions themselves can be more involved. A good interview is carried on in a conversational manner and often becomes a matter in which the respondent becomes really interested.
4. *Leads can be followed up.* In most interviews the respondent gives a hint or a lead to what is really prompting a

particular answer. In personal interviews these leads are noticed by good interviewers and the respondent is encouraged to say more if the subject appears relevant to the enquiry. Many pieces of valuable information, not even thought of during the planning, have been obtained in this way.

5. *Observation is possible.* The interviewer is in a position to observe the respondent and the respondent's home. He can often by observation check the accuracy of replies and he can also answer many points, such as age group, sex, income group, etc., without having to ask the respondent.
6. *A more tactful approach is possible.* When the respondent is not seen, the approach to the interview, or to particular questions, must be the same in every case. In the personal interview, the interviewer is able to some extent to assess the reactions of the respondent and can avoid any errors of tact and suit his manner to the particular situation, particularly where more difficult questions of a personal nature are concerned.

Disadvantages

1. *High cost.* This method is, of course, expensive, since it is necessary to maintain a large field force. In addition, there are the travelling expenses of the interviewers. The actual costs will vary considerably according to the length of the questionnaire, and consequently the time taken per interview, the distances involved, the amount of supervision, etc. But as a rule it will be much higher than for other methods.
2. *Bias from personal contact.* It is precisely because the interview is conducted personally by an interviewer that the danger of bias exists. Two types of bias can result. In the sample itself: if the interviewer selects wrongly, as, for example, if he did not fully understand what was meant by "medium income group". In the replies to questions: if the interviewer affects the respondent by his manner or wording of the question. And, of course, there is the

danger of dishonest interviewers. In all fairness, however, it must be said that these dangers can be largely overcome by adequate training and supervision.

3. *The danger of rushed interviews.* If interviewers are pressed for time, or if they are paid on a per interview basis, they may tend to rush interviews. This may also be caused, if the interview is a long one, by their fear that the respondent may become disinterested and break off the interview before completion. Again, by proper planning, training and supervision this danger can largely be overcome.
4. *Difficulty of contacting certain sections of the community.* There are, of course, certain people who simply will not give an interview, particularly in the highest income groups and in the lowest. Similarly, many housewives work in the daytime and are not available when the interviewer calls. In such cases the interviewer should, of course, call again in the evening, but at that time it is more than likely that the door will be answered by the husband who may not wish to have his wife bothered and may, therefore, refuse the interview on some pretext or other.

The method of personal interviewing is generally the soundest method of conducting market investigations. It must not, however, be necessarily used to the exclusion of all other methods, because both the postal method and the telephone method have their uses and are in certain cases to be preferred to the method of personal interviewing. It is a question of choosing the method which is most appropriate to the particular survey.

The reason why personal interviewing is in so many cases found superior to the other two is that it combines two ways of obtaining information: by questions and by observation; whereas in using the postal method and in the telephone method the advantages of being able to observe the respondent and his surroundings are almost totally absent.

DEPTH INTERVIEWING

It is necessary here to say a few words about the special method of depth interviewing. This is a technique which consists of opening up the subject with the respondent and allowing him to say what he knows, thinks or feels about it, at the same time assisting the process by asking searching questions.

In this method no set questionnaire is used and the interviewer is asked to find out whatever he can from the respondents about the subject being investigated. Normally the interviewer is supplied with a list of points covering the particular aspects of the subject in which the investigation is interested and this is done solely for the purpose of guiding him in his approach to the problem and to avoid wasting his time on complete irrelevancies. Interviewing in depth really means probing the mind of the respondent until every scrap of relevant information has been elicited.

This type of interviewing cannot always be linked with a proper sample survey, because it will often be extremely difficult to make a statistical analysis of the results. No set questionnaire is used and analysis by question is, therefore, impossible, added to which no two respondents are likely to view the problem in the same light and answer questions in the same way. The questions themselves would not necessarily be identical since the technique of questioning is largely opportunist and the questions depend on what the respondent has previously said.

Where depth interviewing is used, it is also generally unnecessary to interview a large number of people since it is qualitative data which is being sought and not quantitative data. An example would be where it was desired to study the methods of marketing in a foreign country. In such a case it would only be necessary to interview a limited number of business executives engaged in marketing, representing different types of concerns and using different methods. Probably two or three of each kind would suffice, and, of course, they would be selected for their probable knowledge of the subject.

The method has already been touched on in the chapter dealing with the framing of questionnaires. For this purpose depth interviewing must be used of necessity because at that stage in the development of the questionnaire there exists only an outline of the subject matter, and from the results of the depth interviews the final questions will be framed. In this process only a very limited number of interviews are carried out, nothing like a representative sample.

Depth interviewing requires a high degree of experience and training on the part of interviewers, and only highly skilled interviewers are capable of undertaking the task. Socially the interviewer must be able to talk to the respondent on his own level, and where technical subjects are concerned a sound knowledge of the subject is a distinct advantage though not a necessity and not as important as sound experience in interviewing.

Chapter XVII

SPECIALISED TECHNIQUES OF MARKET RESEARCH

(Methods of Continuous Research)

Ad hoc surveys (surveys which are carried out once only, usually in order to solve a specific problem) are effective for measuring the penetration of a product in a market or for obtaining the data necessary to the solution of a particular problem. Such surveys are not, however, adequate for measuring the size of a market or giving precise information of the changing competitive position. They may be compared to a snapshot photograph which gives a picture of how things are at a particular moment. To obtain a continuous picture or a running commentary on the competitive race, it is necessary to use methods of continuous research.

THE CONSUMER PANEL

The consumer panel consists of a permanent sample of consumers who have agreed to record their actions and submit the results to the organisers of the panel at stated intervals. This method provides the manufacturer or advertiser with a continuous check on his market and a record of the behaviour of consumers and their reactions to changes in products, methods of marketing or advertising.

The sample is selected in the normal way, but usually by the quota method, to ensure that it is representative according to social or income groups or whatever other characteristics may be desired. The greatest care must, however, be taken to ensure that proper randomisation is observed within these characteristics and that the representativeness of the sample is maintained in spite of the fairly large turnover of respondents, which is a feature of this method.

Respondents are normally obtained through personal interview to see whether the individual respondents or households correspond to the requirements of the desired cross-section of the universe and whether they are willing to join the panel. Usually some inducement is offered in the form of a gift or cash prize, which is awarded on the basis of the amount of co-operation given by the respondent. Points are allocated for the completion of the questionnaire, punctuality, etc., and awards are determined periodically according to the number of points received.

The information is collected at stated intervals and can be obtained by mail, telephone or personal interview. The essential requirement is that the respondent must record his or her actions *at the time of performing them.* This method can be used as a continuous measure for any of the information which can be obtained by *ad hoc* surveys, including brand purchases or use, changes in preferences, newspaper or magazine readership, advertising appeal, etc.

The greatest care must be taken to ensure that the respondent does not get to know for what manufacturer, product or brand the panel has been formed, because once this information becomes known to a respondent his or her actions will be influenced by the knowledge and will become atypical. Like any other method of research, the panel method has relative advantages and disadvantages.

Advantages

1. *Continuous record of the same person's behaviour.* One great advantage of the consumer panel is that it provides a continuous record of the same person's behaviour. This overcomes the difficulty met with in *ad hoc* consumer surveys where there is no effective way of establishing a relationship between a person's past behaviour and his present actions and where for this reason it is difficult to ask questions about past behaviour. In the consumer-panel technique, past behaviour is recorded, and by relating changes or continuity of action to other external factors, such as changes in price, advertising, etc., it is

possible to arrive at sound conclusions about the influence of these external factors on the behaviour of consumers.

2. *Distortions of memory are eliminated.* Since the panel technique provides a continuous record of the respondent's behaviour, there is no need to ask questions on past behaviour, and errors of memory are thus eliminated. The panel organiser need not ask the respondent what he or she bought last week or last month because he already knows this. If changes in consumers' choice of brand occur, they become known almost immediately (allowing time for the information to be collected) and the reasons for these changes can thus be ascertained at the time that they occur. By other methods it may first be necessary to establish the fact that a change has occurred and then find out why. Obviously, if the change occurred some months or even years previously, there is the risk that the consumer's answer will be misleading through his failure to remember accurately.
3. *Effective probing is possible.* This point follows on from the previous one. Very often it is necessary to probe into the mind of the respondent in order to arrive at the real motive or influence behind an action; it is not enough to accept the superficial reason. Because the panel provides a continuous record, and because the respondent's memory is fresh at the time of questioning, superficial answers will be more readily detected and it will be easier to "probe" into the respondent's mind and get at the facts which lie underneath the surface.
4. *Greater reliability.* It is generally accepted that the panel method offers greater reliability than several independent surveys using different samples. Reliability is dependent on the standard deviation of the sample, that is the size combined with the proportions giving an answer A or some other answer. If two different samples are taken at a month's interval, any differences in response must take into account the probable errors of both samples, but where the same sample is being used, as in the panel method, the error is the same and greater reliability can

be attached to the results. Again reliability depends on the amount of confidence which can be placed on the answers; the panel method offers a continuous record of behaviour and, therefore, a means of determining the amount of confidence which can be placed on the answers.

Disadvantages

1. *Expense.* The consumer panel method is, of course, expensive, because it requires a continuous effort to build up and maintain the panel. Unlike other methods of consumer research, it involves continuous work and the continuous employment of staff. The work goes on all the time irrespective of the results achieved.
2. *Heavy turnover of participants.* The heavy turnover of participants which is a salient feature of even the best organised panels is a major problem. The idea of the panel is to establish a system of continuous research with a continuity of membership, so that accurate records can be maintained of the actions of the consumer panel members. This purpose is defeated to the extent that members leave the panel and have to be replaced.
3. *Limited scope of subject matter.* When respondents are permanent, great care must be taken never to include in the subject matter anything which might create a biased attitude, and no questions can be asked which may affect future behaviour. If, for example, a respondent is asked what he thinks about a particular advertisement, the whole of his future behaviour, not only as regards that particular advertisement, but also as regards the appeal, any subsequent advertisement of the same product and the product itself, would be affected, because he would be consciously more aware of the particular kind of advertising and of the product in connection with his panel duties. This increased awareness would tend to make him modify his behaviour even though unconsciously.
4. *Membership of the panel may affect behaviour.* The most serious drawback of the consumer-panel technique is that

continued membership of the panel may tend to make the respondents act differently from other consumers. For example, will the panel member, knowing that he will be asked questions about his reading habits, begin to read better-class newspapers and magazines through personal pride, or is he likely to start smoking a better brand of cigarettes or to cease making his own? Many attempts have been made to prove or disprove that panel membership does affect behaviour in this way, but no conclusive evidence has yet been forthcoming. It is also questionable whether any sustained studies in this field for the purpose of establishing the facts of these hypotheses would be worth while except out of purely acedemic interest.

5. *Bad co-operation of members.* The success of a panel depends on the co-operation of its members. Respondents are required to record daily their actions as and when they are performed. This may be rather a lot to expect of the average consumer. He will often forget to do so and carelessly complete his records at the end of the week, or when the time to send them in draws near. This is only human nature, but it defeats one of the objects of the panel, which is to provide a continuous daily record of behaviour and to eliminate errors due to faulty memory.

Despite the possible disadvantages of the panel technique it is a very valuable device and has on many occasions proved extremely useful. Its value can be increased by conducting occasional independent surveys using different samples of the same universe as a means of collecting supporting data.

THE BRAND BAROMETER

The "Brand Barometer" technique is limited to products which are branded and which have close competitors, such as breakfast cereals, toothpastes, radio sets, etc. It is a technique which supplies at regular intervals an accurate estimate of the proportion of consumers buying a particular product and the

proportions buying competing brands. In the same way that an ordinary barometer gauges the weather, so a brand barometer gauges the competitive position of various brands.

The technique is one which is usually used by a market-research organisation providing a service to which a number of manufacturers subscribe, thus spreading the cost. The research organisation either conducts independent surveys at regular intervals or uses a panel for the purpose. Results are presented at frequent intervals and can be sub-divided by regions or income groups or other suitable factors. It shows the seller how many consumers are using his brand and whether they are increasing or decreasing.

If they are increasing, whether:

(*a*) this is at the expense of other brands, or
(*b*) this is due to an overall increase in the number using the commodity.

If they are decreasing, whether:

(*a*) competitors are encroaching on his position, or
(*b*) all brands are suffering owing to a loss of popularity in the commodity itself or a decrease in purchasing power.

By the use of this technique, regional variations in the demand for a particular brand will emerge and also whether these are being experienced by competitors, and whether the brand is relatively strong or weak in certain areas. Evenness of distribution among various age groups or income groups as compared with competitors would emerge, as also the increases or decreases in the sales of the brand as compared with the general increases or decreases in the sales of the commodity, and, consequently, whether the brand is achieving a reasonable and economical share of the total market.

Any seller of a branded product is vitally interested to know the competitive position of his brand and the size of his sales to consumers. Factory sales figures are not sufficient to tell him this, as they are merely records of the quantities which

have moved to dealers' shelves. When changes in consumer demand occur, they are not reflected in factory sales figures for a considerable period, by which time it is perhaps too late to exploit a favourable development or an uncorrected weakness may have done considerable damage. The brand barometer technique reflects the position at the time and thus gives the manufacturer the opportunity to act immediately to take advantage of a favourable situation or remedy an unfavourable one.

THE INVENTORY AUDIT OF RETAILERS' SALES

The inventory audit method of assessing retailers' sales to consumers was made familiar by the A. C. Nielsen Company and is commonly known as the Nielsen Index. This is a continuous method of market research designed to supply manufacturers with essential marketing facts. So far, in the United Kingdom the Nielsen Company operates three separate indices: the Food Index, the Drug Index and the Pharmaceutical Index.

The service provided is, however, just as useful to manufacturers of other products and will no doubt be extended to other fields of trade at suitable opportunities. The basic principle is that the manufacturer does not generally know what are the sales of his product over the counter to the consumers.

He will, of course, know his sales to his customers, but since these are wholesalers and retailers whose stocks may remain on their shelves anything from one to twelve months, factory sales figures reflect changes in demand only a considerable time after they occur and then only partially.

In addition to consumer sales trends for the entire country, the Nielsen Index can also supply separate trend curves in the same form for each geographical division of the country, each size of town, each type of retail outlet, each type of shop. Thus the manufacturer can learn accurately and promptly the condition of each segment of his market and the results of any marketing decisions he might have made. Similarly, he can be supplied with the same information on his competitors'

products and can assess the results of any marketing moves they may have made.

The method of operating the system is to measure consumer sales continuously by detailed, personally conducted audits of invoices and stocks in over 1,400 typical multiple and independent shops. These shops are selected on the basis of established sampling techniques, but in order to determine the exact characteristics of the universe the Nielsen Company conducted a private census of shops, so that the eventual sample would be truly representative.

For the purpose of the Nielsen Indices the United Kingdom is divided up into five geographical areas. In addition, cities and towns are divided up into four sizes and shops are divided into two types—multiples and independents, independent traders being further divided into three shop-turnover size groups. Each territory, each city size, each shop size and each shop location (i.e. main shopping centre, neighbourhood, etc.) is represented in its proper proportion. The shops and stores are located in carefully selected cities and towns ranging in size from the largest, London, to rural places with small populations.

A contract is made with each shop and each multiple organisation by which the A. C. Nielsen Company has the privilege of taking a stock count and auditing the invoices for all goods coming into the shop. Co-operating multiples and independents are compensated with cash and marketing information. This information is of value to the co-operating shop, as it permits comparison of its activities with those of all other shops in its area, city size group, etc. The consumer-sales figures thus obtained from individual shops are merged and expanded to a total for the entire United Kingdom.

The retailer is not relied upon for any sales information. He merely saves each invoice, including those for occasional cash purchases, and keeps a record of any non-consumer trading. A special auditing method reveals instantaneously any failure on the part of the dealer to keep invoices. The principles employed are illustrated in the following diagram.

PRINCIPLES OF NIELSEN INDEX AUDITING

BLANK BRAND CEREALS . SMITHS STORES

	NO OF ORDERS	PKGES	VALUE	PKGES
STOCKS JAN. 1st.				172
PURCHASES				
FROM MANUFACTURERS	1	144	£3.12.0	
FROM WHOLESALERS	5	60	1.12.6	
	6	204	£5. 4. 6	204
AVAILABLE FOR SALE				376
STOCKS MAR. 1st.				120
CONSUMER SALES				256
PRICE Per Package			7½	
TOTAL £ Sterling			£8. 0. 0	

Since participating manufacturers use the data obtained as the basis for making decisions which may involve large sums of money, every care must be taken to ensure accuracy. The information obtained by the auditors includes:

1. Sales to consumers.
2. Purchases by retailers.
3. Retail stocks.
4. Stock turn.
5. Distribution (shops handling).
6. Percentage out of stock.
7. Prices (wholesale and retail).
8. Retail gross profit.
9. Direct versus wholesale purchases.

Diagram reproduced from "Marketing Research as a Tool of Successful Management" by permission of A. C. Nielsen Co., Ltd.

10. Average order size.
11. Dealer schemes (displays, speciality advertising, etc.).
12. Total sales all commodities.

After collection of the data, they are tabulated centrally by the use of machines and individual shops, then lose their identity. As the information is on tabulating cards, any special breakdown is easily obtained, and it is these breakdowns (i.e. sales in shops with displays versus sales in other shops) which frequently furnish the solution to some of the most perplexing marketing problems.

This is necessarily only a brief account of a special adaptation of market-research technique; the reader who wishes to know more about the Nielsen Index method is advised to read *Marketing Research as a Tool of Successful Management* by Dr. Edward L. Lloyd, managing director of the A. C. Nielsen Co. Ltd., Oxford, England, and published by them.

THE LABORATORY SHOP

The laboratory shop is a device for obtaining market information used by manufacturers, whereby they set up one or more independent shops in various localities for the purpose of discovering how various products sell. The more shops are set up in widely scattered localities the more effective the system will be, since the information will be obtained from a more representative selection of the market.

1. Control by the manufacturer is kept secret. Although the shops are owned by the manufacturer, they operate in exactly the same way as any other shop. Usually they are managed independently and goods are bought both from the manufacturer and from his competitors in the normal course of business and in accordance with the demand for them. The link between the manufacturer and the shop manager is that he is an individual, usually in the manufacturer's employ. Even he will often not know the identity of the manufacturer and the latter will delegate an executive who figures as an independent owner, but who

does not interfere in the running of the shop. This executive behaves as any other owner of an independent shop might behave, but ensures that he obtains the relevant data on the purchase and sale of products to pass on to the manufacturer concerned.

2. The profit motive is subordinated to the research motive even to the extent of the shop being subsidised. Great care is necessary here to ensure that the manager of the shop does not become aware of anything unusual in its running.
3. The manufacturer should never attempt to use these shops for the purpose of pushing his own lines since such an attempt would immediately defeat the purpose for which the shops have been set up. His travellers call as they do on other shops, and to prevent any forcing of the manager the representatives should not be aware of the special relationship between the manufacturer and the shops.

This method has certain specific advantages to the manufacturer:

1. New lines can be tried out and consumer reaction noted before wholesale manufacture.
2. A check can be kept of special terms offered by competitors.
3. Local advertising prior to national advertising can be tried out in the area of these shops and its effect noted.
4. The effect of national advertising can be judged.
5. Ultimate customers of products can be broken down in terms of age, sex, class, etc.
6. The shops can be used as a practical method of investigating any problem which may interest the manufacturer.
7. Complaints can be noted for all products, own and competitors'.
8. As the manufacturer is in the retail trade, he is kept in sympathy with the dealers' outlook and that of the final consumers.

Laboratory shops must not be confused with a manufacturer's own retail outlets which exist as such, as is common in the boot-and-shoe industry, where manufacturers perform all functions from manufacture to retailing. The essence of a laboratory shop is that the identity of the manufacturer behind it is unknown and this is essential to the success of the method.

PRODUCT TESTING

However good or technically perfect a product may be, it will be a failure from a marketing point of view unless it meets with acceptance by the consumers. A manufacturer who has determined beforehand that his product will meet with acceptance and in what market, in terms of people and locality, that acceptance will be most likely, starts his marketing programme with a marked advantage over his competitor who has no such knowledge.

A specialised form of market research known as "product-testing" is used for this purpose. It is, of course, most applicable to consumer goods, which are bought frequently but can also be of great advantage in the fields of durable goods and capital goods. The method covers not only the general acceptance of a product under normal working conditions but also establishes the influence of specific factors which have a bearing on its acceptance, such as design, colour, shape, size, package, taste, quality, perfume, convenience in use, etc.

Product research must inevitably have two aspects:

1. Technical research on the product.
2. User research.

In the more highly technical fields this is recognised, so much so that the technical user's need is the driving force behind the manufacturer's research to find a product to meet this need. Medicine is a specific example of where this applies. But the principle holds good in the field of everyday products used by the ordinary man and the housewife.

It will not be possible to arrive at a product which will satisfy everyone, but it will be possible to achieve the *greatest*

measure of acceptance. Product-testing is not confined to new products or to studying the performance of old products in a new market. The need for it can also arise as the result of declining sales or from the desire to test new features or ideas. It can also arise out of technical developments in the laboratory or design shop which, though they improve the product technically, must nevertheless be tested in relation to consumers' reactions to ensure that they will be acceptable and to discover how to obtain the greatest marketing advantage from them.

Method

The exact method used in product-testing depends largely on the varying requirements and the purpose of the test, the type of product and the problem. The range lies between a straight choice of two alternatives and the case where the various characteristics and the number of possible alternatives are so numerous and complex that a whole series of tests is necessary, each one dealing with a limited number of characteristics or alternatives. There are, however, four basic principles which are common to all product tests:

1. The variable factors about which answers are required must be isolated.
2. All other factors (other than those being tested) should be constant.
3. Samples of the product being tested should not bear the manufacturer's brand or name and should be distinguished only by a mark, which does not of itself suggest an order of preference.
4. The order in which the samples are tested must not suggest an order of preference. To avoid this the samples should be divided into two halves to enable the second half to be tested in the reverse order from the first.

Once the samples have been prepared in accordance with these principles the procedure varies little from that of a normal consumer survey and is as follows:

1. After the universe has been closely defined, bearing in mind the nature of the product, a suitable cross-section of consumers is selected in accordance with the method of sampling decided on.
2. The questionnaire is prepared and tested, and here the principles are exactly as outlined in chapter XI.
3. The samples for testing are distributed to respondents, and arrangements are made for call back visits.
4. At the first interview with the respondents information of a general nature is obtained such as might be required in a normal survey.
5. After the period necessary for testing, the second call is made and the questionnaire is then completed.

SIZE OF THE SAMPLE. The size of the sample of the universe to be used in the test will depend on the requirements of the test itself. If it is a question of a simple test of two alternatives, two or three hundred interviews may be entirely adequate, but where tests are complicated, considerably larger samples may be required. This is in accordance with the principles already outlined in connection with the complexity of the questionnaire. Each product test poses its own problems and some of the factors which may have to be considered are as follows:

1. Laboratory tests may indicate that a substantial difference in preference is to be expected, thus calling for a larger sample.
2. Previous experience of testing similar products may give an indication of the results to be expected.
3. As with normal surveys, a test to bring out overall results only will require a smaller sample than one which is designed to break down results by universe characteristics such as areas, income groups, age groups, etc.
4. It may be necessary for individual and separate tests to be made for each purpose or it may be sufficient for each respondent to test the products for several purposes.
5. The purpose of the test is important. Approximate product equality may be sufficient, or, on the other hand, only a clear product superiority may be acceptable.

THE QUESTIONNAIRE. A very important aspect of product-testing lies in the framing of the questionnaire, which offers probably more pitfalls than in a normal survey. As an example of the care which must be taken, in a test to determine product preference, the question "which of these two colours do you prefer?" might be asked. Such a question would be psychologically unsound, because it shows the respondent that he is expected to prefer one of the colours, whereas had this not been suggested by the question he may have had no preference and liked or disliked both equally. A better approach would be to ask him what he thought of the two colours. His answer would almost inevitably indicate a preference, and this could be further tested by asking his reasons for his likes or dislikes. As a general rule no question should be asked which would indicate to the respondent that he was required to adopt a particular attitude or answer in a particular way.

ASSESSING ALTERNATIVES. When it is a question of a straight choice between two alternatives, the results are usually fairly easily determined without any very complicated analysis. It sometimes happens, however, that it is necessary to establish the relative acceptability of a number of different products or different product attributes.

For example, a food product may be manufactured in several different flavours. It would be unreasonable to expect one person's sense of taste to remain sufficiently acute throughout the test to achieve really reliable results. There are thus physical reasons, when dealing with the senses, or other practical reasons, why all the differences should not be tested at one time.

To overcome this difficulty the different products or attributes are tested in pairs against each other, each person being asked to test one pair only. Thus, if it were a question of testing four different flavours, flavour A would be tested against flavours B, C and D separately, and the following six tests would be necessary:

A against B	B against C	C against D
A against C	B against D	
A against D		

The same principle would apply where it was desired to test more than one characteristic together for the purpose of assessing their combined effect, for example where there were several possible colours and alternative sizes. Supposing the colours were A, B and C and the sizes X and Y, we should then have the following series of tests:

AX—AY	AY—BX	BX—BY	BY—CX	CX—CY
AX—BX	AY—BY	BX—CX	BY—CY	
AX—BY	AY—CX	BX—CY		
AX—CX	AY—CY			
AX—CY				

It should be noted, however, that such attributes would normally be tested separately unless there were a very cogent reason for not doing so. It will be readily appreciated that the greater the number of alternatives, the greater will be the sample, and consequently the greater the cost.

By this method it is possible to control for each test all factors except the one which is being tested and it is thus possible to assess the relative acceptability of each factor.

In problems where it is necessary to decide between several variants of the same attribute, as, for example, between several different colours, it is possible to present all the variants at the same time and use the technique of elimination. For example, if it were a choice of colour which was in question and the product could be produced in four alternatives, the respondent would be asked which he liked best and which he liked least. Having obtained his reply, his first choice would be removed and he would then be asked which of the remaining three he would choose if his choice were thus limited. His answer to this question establishes his complete order of preference.

It must not be thought that the product or attribute which achieves the highest number of first places is necessarily that which has the greatest measure of acceptance, since it may be very acceptable to one section of the population while being completely unacceptable to another. A product or attribute

which is a compromise between these two extremes may thus be the most generally acceptable.

To establish this fact, it is necessary to weight the results, by allotting points for first, second, etc., place.

Supposing the results in respect of the four colours were as follows:

	1st Preference	*2nd Preference*	*3rd Preference*	*4th Preference*	*Per cent*
Blue	40	10	10	40	100
Green	10	50	20	20	100
Yellow	30	20	50	—	100
Red	20	20	20	40	100
	100	100	100	100	

We might allot 3 points for first place, 2 points for second place, 1 point for third place, and no points for fourth place. On this basis the total possible number of points would be 300 (which would occur if any product achieved 100 per cent first places). The weighted results would then be:

Blue $(40 \times 3) + (10 \times 2) + (10 \times 1) + (40 \times 0) = 150$, 50 per cent of possible.

Green $(10 \times 3) + (50 \times 2) + (20 \times 1) + (20 \times 0) = 150$, 50 per cent of possible.

Yellow $(30 \times 3) + (20 \times 2) + (50 \times 1) + 0 = 180$, 60 per cent of possible.

Red $(20 \times 3) + (20 \times 2) + (20 \times 1) + (40 \times 0) = 120$, 40 per cent of possible.

From these results it is apparent that yellow is probably the best choice in this case because it has the greatest general acceptance. These results would, of course, be studied in relation to the respondents concerned. If, for example, the 40 per cent first places for blue came from a well-defined group of persons, say the highest income group, it may be considered worth while to produce in this colour specially for that section of the population.

Product-testing techniques are not only confined to the product itself and its characteristics, but are equally valuable when applied to package design. Where a product is sold already packaged, the package itself becomes an integral part of the product and of vital importance in the promotion of the sales of the product.

Chapter XVIII

WHO SHOULD DO THE WORK

A GREAT deal of controversy has raged from time to time over the question of who is best fitted to undertake the work involved in market research. Much of this controversy has undoubtedly been influenced in the past by the fact that there have been unscrupulous and unqualified persons operating in this field.

This is, however, largely a matter of past history, and in all fairness it can be said that today the large majority of market-research practitioners are bound by a high code of professional conduct. An unscrupulous practitioner can do immeasurable harm and bring discredit to the profession, and it is to protect themselves that genuine members of the profession now insist on these professional standards.

The Market Research Society of Great Britain is a professional body, which has done much to influence this trend in recent years, and which will undoubtedly do more in the future as its influence becomes more widespread. A good example of the society's work in this field is to be found in its interim report and recommendations by the sub-committee on standards in market research, covering the standards of practice to be used in the reporting of survey results.

Whoever is responsible for the work of planning, collection of data, tabulation, analysis and interpretation must, in addition to being technically qualified to undertake the work, be guided by the completely objective approach of the scientist. This is perhaps the most important single attribute a research worker should possess.

There are two possible ways by which the industrial and commercial concern can have the work done:

1. By having its own market-research department.
2. By commissioning an independent organisation to do the work.

It is now proposed to consider the arguments for and against each of these possible alternatives.

OWN MARKET RESEARCH DEPARTMENT

Undoubtedly the most efficient method of carrying out market-research work is for a concern to employ its own market-research department, provided that it has a properly qualified staff and all the facilities at its disposal that are essential to the efficient prosecution of the work.

The most important advantage of this system is that the research workers are not only experts in their own profession, but they also develop an intimate knowledge of the products concerned, and bring their accumulated experience to bear on current problems. This avoids the necessity of having to furnish them with descriptions of the products and the operations of the concern before the work can begin.

Another advantage lies in the fact that such a department is able to develop continuous studies of products and their markets, from the inception of the products and their testing to the continuous evaluation of their performance in the market. At the same time this department can assume responsibility for the collection and analysis of all market and economic data and its submission to top management.

It is, of course, only the large concern that can employ a specialist market-research department of its own, firstly, because it is only a large concern that can afford the expense of setting up such a department and, secondly, only the large concern has a sufficient volume of turnover to keep such a department continually occupied and to warrant its existence.

A market-research department will be useless unless it is operationally independent of the management and particularly of the departments responsible for marketing and selling and advertising. Its relationship to top management is a staff

relationship and it will lose its objectivity if it is allowed to be dictated to as regards the manner in which it carries out its work.

It must have the same degree of working independence as an outside practitioner and should be headed by an executive, expert in market research. Top management and heads of other departments should confine themselves to indicating what problems they wish to be investigated, leaving the method entirely to the jurisdiction of the research executive.

The reason for this independence lies in the need for objectivity, and if the market-research department were controlled by the sales director or sales manager it might find it difficult to report objectively where mistakes of judgement by these executives were involved and which may, of course, lie at the root of a problem. A sales executive may look to research to confirm his own opinions or conclusions and might be inclined to ignore any findings which did not do this. This is not altogether an uncommon attitude.

The expense involved in a market-research department is, of course, its main disadvantage. For efficiency it is also necessary to maintain at least a skeleton field force for the purpose of training and supervising investigators, who can often be recruited *ad hoc* for particular surveys. It is, however, becoming difficult to recruit field workers and the tendency is now for research departments and organisations to maintain their own permanent investigators.

A very usual argument against concerns having their own research department is that such a department will tend to lose its objectivity through being too close to the concern's problems. Provided, however, that the department's independence is maintained, there should be no danger of this occurring.

A market-research department is likely, however, to specialise too closely in the particular techniques that are most used by the concern and thus lose touch with other techniques, which may occasionally leave it at a loss. Certainly, where very specialised techniques such as the Nielsen Index or brand barometer are necessary, they should be left to the specialist organisation. Quite apart from their greater efficiency in the

use of these special techniques, the fact that they have the necessary organisation for this work also means that they can provide the service at a fraction of the cost that would face a market-research department if it attempted to do the job itself.

THE INDEPENDENT ORGANISATION

The independent organisation can be of two kinds: (1) organisation concerned with market research only, and (2) organisations which are departments or subsidiaries of advertising agencies. In principle the advantages and disadvantages of either organisation are similar, though there are a few points that apply to the advertising agencies only.

The main argument advanced in favour of the independent organisation is that it is less expensive to the individual manufacturer. This is, of course, only a relative advantage and depends entirely on the manufacturer's capacity to use market research. If the manufacturer is large enough to keep a market-research department continuously occupied, the argument does not hold water. On the other hand, where a manufacturer is too small to have his own market-research department, there is no way of doing the work other than through an outside organisation.

The criterion as to which is best must be that of efficiency, and it is from this point of view that the arguments for and against must be considered.

It is claimed that by concentrating on market research the independent organisation becomes expert at the work and amasses a wealth of experience and technical data which enables it to offer a first-class service. This is undoubtedly true. It is, however, also true of the manufacturer's own market-research department, since in this respect it is in precisely the same position. Except in the case of organisations using very specialised techniques such as the Nielsen Company already mentioned, where a manufacturer's own department could not compete in efficiency, this argument hardly holds good.

Again, the argument is advanced that because of its independent position the independent organisation can main-

tain a completely objective approach to the manufacturer's problem. This also applies in the case of the manufacturer's own market-research department provided the latter is given the same operational independence. As against this, the argument can also be advanced that the independent organisation has not the same opportunity of acquiring so intimate a knowledge of the product or of its previous marketing history.

Whatever the arguments for or against independent market-research organisations, it is undoubtedly true that the modern independent organisation is fully competent to undertake any market-research work a manufacturer may have. Such an organisation is expert in its field, has the necessary resources of trained staff, experience and knowledge, and will approach any problem in the best traditions of scientific research.[1]

Some research organisations refuse to make recommendations to their clients, maintaining that their task is confined to finding facts and giving their correct interpretation. Such an attitude assumes that the client is capable of correctly relating the knowledge thus acquired to his own problems. While this is undoubtedly true of well-managed concerns that employ competent executive staffs, can it be assumed to be true of every concern that needs market research?

The fact that independent market-research organisations are fully competent to do their job cannot be taken to mean that they are any better at it than manufacturers' own departments. In fact, the latter can be just as competent technically, added to which they would normally have a far more intense product knowledge. This controversy is not confined to the field of market research alone. The arguments for and against outside organisations and internal departments can be raised in connection with almost any specialised function and have in

[1] A word of warning is, however, necessary. While it is true that the independent market-research practitioner provides a first-class service, this is only true to the extent that he employs the necessary permanent office and field staff to enable him to carry out the work efficiently. Any organisations who, while claiming market research as one of the services they offer, have in fact no staff and must resort to an organisation that has, cannot offer the same quality of service. Apart from the unethical practice of calling the work done their own, this results in increased costs to the manufacturer since he is also paying them a fee over and above the original cost of the work.

fact been raised in connection with advertising departments, legal departments and many others.

THE ADVERTISING AGENCY

Market research began as a commercial technique in the advertising agencies. It was they who were largely concerned with its early development, and it was used as an aid in developing advertising campaigns and also as an added inducement to manufacturers to use the services of the agencies that had market-research facilities.

Since those early days, however, there has been much progress, and today, where market research is offered as a service by reputable advertising agencies, it is a perfectly genuine and efficient service maintained for the benefit of the agencies' clients. Many agencies maintain not only market research departments but also a fully competent marketing advisory service which can, in a consultant capacity, be of great benefit to the individual manufacturer.

In a large number of cases advertising agencies maintain their market-research organisations as separate entities, usually as a separate company which is fully independent. In others the market-research organisation may be a department, but one which is given the necessary degree of independence from the main advertising organisation. In this way, it is hoped to achieve the required degree of detachment and the objective outlook essential in any research work if bias, due to too close a contact with the problem, is to be avoided.

A market-research organisation run by a modern advertising agency can be claimed to be every bit as competent and as objective as any other independent organisation whose activities are confined to market research only. It must, however, be realised that the main argument against using advertising agencies for market-research work is that being intimately interested in the marketing and advertising of a product they cannot maintain the necessary degree of detachment and may allow their own interests in the publicity for the product to influence any investigation.

While there may well be unscrupulous or less efficient agencies of whom this is true, it can probably be safely assumed that in general the standards are very high. Business men, in advertising as in any other field, realise the value of goodwill and the absolute necessity of maintaining high standards of service. It is unlikely that they will damage their business, even in the long run, by inferior or dishonest work.

SALES MANAGER AND SALESMEN

There is a section of opinion against the practice of allowing a sales manager to carry out the work of external market research or allowing him to conduct and control field investigations. The argument runs, that quite apart from the fact that he probably has not the necessary qualifications for the work involved, he, of all people, is far too close to marketing and sales problems to ensure an objective approach.

This does not mean that he will be dishonest. On the contrary, he may have the highest moral standards. The fact is that bias works subconsciously, and when a man is in daily contact with a problem it is well nigh impossible, however hard he may try, to maintain complete objectivity.

A good sales manager will, however, keep a close watch on his markets and to this extent will do market research. He should also ensure that records are maintained, which lend themselves to detailed analysis, and that he receives continuous reports from his salesmen, agents and dealers. He should not, however, be expected to investigate marketing problems or control such investigations.

A sales manager is, of course, intimately concerned with the results of market investigations and should know what is being done in that field or himself decide the need for investigating specific problems. He must not, however, say how the investigation should be carried out or influence its operation.

Very much the same principles apply to the employment of salesmen as field investigators. They can neither have the objective approach nor the right attitude of mind for this kind

of work—quite apart from the fact that it is not their job and time spent on research is lost to the work of getting orders.

Again, a salesman might be the most honest man in the world, but it would be rather too much to expect him to report unfavourably on his own work, a situation which may easily arise.

It is often claimed that the use of salesmen for field investigations considerably reduces the cost, since the cost of field investigators is usually the largest single cost item in any survey. The answer to this claim lies in the fact that bad or incompetent research is worse than no research at all and will often prove far more expensive in the long run than a really good job in the first place.

QUESTIONNAIRE

This questionnaire and related information is reproduced by courtesy of SALES RESEARCH SERVICES LIMITED.

EXPLANATORY NOTES.

The questionnaire, which is reproduced here, was used in April 1949 on a sample of 6,757 homes. The purpose of the survey was to assess various aspects of the market for electric irons.

1. The questionnaire is designed for personal interviewing, and before investigators begin their work they will have been carefully briefed on the intention of each question. This briefing is to enable them to guard against any misinterpretation of questions by the respondent.

   For example, in Q.15 (a) the single word "why" would not be used by itself. The actual wording of this question would have to be related to the answer to Q.15 and the interviewer would put it in such a way as to be most likely to elicit the correct answer. In mail questionnaires there is not this degree of flexibility and it is often difficult to word them in a way that will both procure the desired information and avoid some misinterpretation.
2. The questionnaire begins with a grid or cage, which gives descriptive information about the respondent. This is basic data to enable various classifications to be made and according to which the results can be analysed, e.g. by area, social class of family, age of housewife.
3. It will be noticed that Q.1. and Q.2. are designed to find out if any washing is done at home and how much. These are general "opener" questions and on the answers to them will depend the general conduct of the interview. Similarly Q.3. and Q.4. deal with the supply of electric current and upon them will naturally depend whether some of the subsequent questions are asked. Incidentally, Q.3. would almost certainly be answered by observation.

4. The questionnaire is "open" coded, for punched-card analysis, that is to say, that although it is pre-coded, it is not completely so for every question. These are questions for which the number of different replies that may be forthcoming is not known in advance. To any question a number, say twelve, of possible answers has been allowed for, but only the column number has been given and the coding is completed during the editing process after sufficient replies have been examined to enable the possible answers to be determined. Thus Q.10, column 26/ would allow for twelve different price ranges to be coded in. It is unlikely that more would be required in this case, but if they were, these would have to be tabulated manually.
5. All the questions would not be asked at every interview. For example, Q.5. would not be asked if the answer to Q.3. was "No". If Q.5. showed that an electric iron was in use, then Q.6. and Q.7 would not be asked. Similarly Q.10 would not be asked unless the answer to Q.9 indicated that the respondent had herself bought her iron.
6. Q.17 and Q.20 are designed to discover the reading and cinema-going habits of the housewife, and have been included for the purpose of obtaining information that would be useful for advertising purposes. They are not essential to the main purpose of the survey and it should be observed that they have been placed at the end of the questionnaire.

Some Analyses of Results

The analysis of the answers to Q.5 combined with other analyses would enable a brand barometer to be constructed. As already previously explained, such information, if obtained on a continuous basis, would be of the utmost value to a manufacturer. The following tables show, in addition, some of the vital information which resulted from this particular survey.

Table A.[1]

THE EXTENT TO WHICH LAUNDRY IS WASHED AT HOME

(PERCENTAGE OF SAMPLES)

Area	*None done at home*	*Small articles only done at home*	*All done at home*
Greater London	10·4	49·7	39·9
South Eastern	9·6	38·0	52·4
South-West and Wales	9·7	34·9	55·4
Midlands	9·0	32·4	58·6
Northern	8·5	29·1	62·5
Scotland	7·9	27·6	64·6
Great Britain	9·2	35·9	54·9

Note: This table can be further tabulated by class of family, size of family, age of housewife, etc.

Table B.[1]

THE EXTENT TO WHICH VARIOUS KINDS OF LAUNDERING IRONS ARE OWNED, SHOWN BY CLASS OF FAMILY

(PERCENTAGE OF SAMPLES)

Great Britain

Kind of Iron	*Total: All families*	*All families earning over £400 per year*	*All families earning £400 or under per year*
No iron	1·8	1·7	1·8
Gas iron	2·7	1·5	3·1
Flat iron	24·2	5·4	29·7
Electric iron	71·3	91·4	65·4

Note: This table can be further tabulated by area, class, size of family, etc., and cross-tabulated with any other group.

[1] Reproduced from *The Bulletin of Marketing Facts*, Vol. 1/2, August 1949, published by Sales Research Services Limited, 62 Victoria Street, London, S.W.1.

SPECIMEN QUESTIONNAIRE

Sales Research Services Ltd., 62 Victoria Street, S.W.1.
Victoria: 3056/7

Job No. 1/429

Name .....
Address .....
Town 2/
Investigator 3/
Checked by .....

Income Group:	
Class A	4/1
,, B	2
,, C	3

No. in Family:	*M.*	*F.*
Under 5 yrs.	5/	8/
5–15 yrs.	6/	9/
15 yrs. and over	7/	10/

Occupation of Chief Wage Earner..... 11/
Aids to Classification .....
Date of Interview..... Age of Housewife.... 12/

1. Do you do any washing at home for your family?

Yes, all	13/1
Yes, some	2
No, nothing	3

2. *If "yes, some"*. What articles do you usually wash at home, and what do you send to the laundry?

	Wash at Home	*Send to Laundry*
Small articles	14/1	2
Heavy articles	3	4

3. Have you electric lighting in your home?

Yes	15/1
No	2

4. Have you any other electric points besides lighting?

Yes	16/1
No	2

(a) *If Yes.* Where are they (rooms)? 17/

5. Do you use any of the following electrical equipment?

Electric Washer	18/1	Make	19/
Electric Iron	2	Make	20/
Electric Clothes Drier	3	Make	21/

For those who have NO ELECTRIC IRON:

6. What kind of iron do you use?

Gas	22/1
Flat	2
Never use an iron	3

7. Why do you not use an electric iron? 23/

For those who DO USE AN ELECTRIC IRON:

8. How long have you had this iron? _____ 24/

9. Where was it bought? Not bought—gift _____ 25/1
Not bought—hired _____ 2
Bought at (type of store) _____

10. What price did you pay? _____ 26/

11. What is its weight? _____ 27/
(a) Is this the right weight for you? Yes _____ 28/1
Too heavy _____ 2
Too light _____ 3

12. Has it controlled heat? (e.g. Low, medium, high, wool, silk, cotton, linen, rayon, etc.) Yes _____ 29/1
No _____ 2

(a) *If Yes.* Do you find these give the right sort of heat for the job, or don't you use them?
Right heat _____ 29/1
Not the right heat _____ 2
Never bother to use _____ 3

13. Has your iron an indicator light? Yes _____ 30/1
No _____ 2

14. Have you any criticisms or suggestions which you feel would improve your electric iron? If so, what are they? _____
_____ 31/

15. If you were buying an electric iron tomorrow, what particular features would you look for? _____
_____ 32/
(a) Why? _____ 33/

16. Where would you go to buy it? (*Type of store*) _____
_____ 34/

17. What women's magazines did you read during the last month? _____
_____ 35/

18. What daily newspaper/s did you read yesterday? _____
_____ 36/

19. What Sunday newspaper/s did you read last Sunday? _____
_____ 37/

20. About how often do you go to a cinema? _____ 38/

GLOSSARY OF TERMS

Like any other specialised field of activity, market research has its own technical vocabulary. The ordinary language and the accepted sense of everyday words and expressions are not capable of conveying every technical idea, and for this reason a technical vocabulary arises, by the use of which it is possible for practitioners to convey in one word or expression ideas that would otherwise require the use of a score of words.

A technical vocabulary must not be confused with the sort of jargons which have been dubbed "Whitehallese" and "Commercialese" and which confound the layman and surround a subject by expressions which make it appear to be more impressive than it really is. No one would accuse medical language of being jargon in this sense.

The following glossary contains the terms more commonly used in the field of market research, some of which have been borrowed from other fields, particularly the science of statistics. It also contains some terms used in allied fields. The texts are not intended to be exhaustive definitions but rather explanations which will help the reader to understand the meaning of the terms used.

ACTUAL MARKET. The actual market for a product is the sum total of consumers purchasing and using the product in question, thus in terms of quantity the actual amount of the product being sold.

AD HOC. That which is done by reason of the circumstances obtaining at the moment.

Applied to market research enquiries and surveys—those which are undertaken in the light of particular circumstances or for a limited purpose. Usually single pieces of research which are not part of a continuous process.

ADVERTISING. Paid for and non-personal spreading of information about a business concern or its products for the purpose of

stimulating demand and stabilising the flow of goods from production to consumption. Advertising includes the press, posters, direct mail, exhibitions, radio, public relations and other forms.

ANALYSIS. A process by which a complex thing is resolved into its elements. Qualitative analysis reveals the presence of certain factors, quantitative analysis determines the numerical value of the factors present. Thus, in marketing, analysis determines the presence of certain factors and the relative influence of each factor. For example, the analysis of sales by territories to determine the contribution that each sales territory makes to total sales.

APPEAL (in advertising). A message or theme used in advertising for the purpose of obtaining a response from consumers or potential consumers by playing on their emotions.

AREA SAMPLE. A sample selected on a geographical basis, where the territory to be covered is broken down into small but comparable areas, some of which are then picked out at random to form the basis of the sample. Within each small area (or cell) the actual sampling units are then selected.

ATTITUDE QUESTION. A question which is designed to determine a person's attitude or reaction to or opinion on a pertinent point. For example, to find out what a person thinks about a new feature incorporated in a product or what he thinks about the credit policy or advertising of a competitor.

AVERAGE. The common average or arithmetic mean is a measure of central tendency, which is found by totalling the values of a number of measurements and dividing that total by the number of measurements recorded.

BIAS. A systematic error running through the whole or part of the sampling operation, the essence of which is that it forms a constant component of error recurring at each subsequent step. Bias can be due to a variety of factors and can take place at any stage of the sampling operation from the planning of the work to the interpretation of the results. It is an error which is not cancelled out by errors in the opposite direction in other elements

of the sample, but rather it is aggravated by occurring in the same direction in these other elements.

BRAND BAROMETER. A method of continuous market research, which enables the degree of and changes in brand acceptance to be measured and by which comparisons between different brands can also be made.

BREAKDOWN. The division of a sample or the analysis of results according to specific factors; e.g. by income or age groups, by sex, etc. (See also Cross-tabulation.)

BREAK-EVEN. The break-even point is that point at which income exactly equals expenditure. The use of the break-even technique enables the relationship between sales and various cost items to be established in terms of money and volume of transactions.

BUDGET. A statement of the possible and desirable income for a forward period of time and of the various expenditures necessary to achieve that income.

CALL BACK. A repeated attempt to interview a respondent for the purpose of completing an interview or a check call by a supervisor.

CENTRAL TENDENCY. A measure of central tendency is one which summarises a number of values by providing one value, which is an expression of the combined tendencies of all the values. Some measure of this kind is essential to give meaning to a mass of data. Measures of central tendency are: the average or mean, the median, the mode.

CHECK LIST. (1) A list of possible answers attached to a question and one item or several items of which are marked according to the respondent's answer.

(2) A list of points prepared at the beginning of a study for the purpose of checking that all relevant points have been covered.

CODING. The process of reducing answers to a series of code numbers in order to facilitate tabulation. (See also Pre-coding.)

CONCLUSIONS. The final deductions made from the results of a study expressed in terms which leave no doubt as to these results and which point to the action which is required.

CONSISTENCY. The degree to which data measuring the same things or closely allied things agree among themselves.

CONSUMER. In the widest sense, someone who purchases and uses a product. In this sense the consumer of a product can be a manufacturer who uses the product for the production of a further product. In market research, however, the term usually refers to the final consumer, i.e. the public. (Cf. Consumer research.)

CONSUMER PANEL. A research technique which consists of selecting a properly constructed sample of consumers for the purpose of continuously reporting their day-to-day purchases. The reports of the panel members are collected at regular intervals and from their analysis changes in consumer demand and consumer attitudes can be established.

CONSUMER RESEARCH. External research consisting of direct questioning or observation of the general consuming public—usually by the method of sample surveys.

CONTROLLED SAMPLE. A sample which is controlled according to the known characteristics of the universe or population. These characteristics are known as controlling factors and are included in the sample in the same proportions as they occur in the universe or population.

COPY (in advertising). The matter which is to be reproduced in type.

COPY-TESTING. Research for the purpose of evaluating the relative probable response to various kinds of advertising copy.

COSTING. The process of establishing the cost of the various constituents of industrial and commercial activities.

CROSS-SECTION. A segment of a universe or population in which all the characteristics of that universe or population are represented in their true proportions.

CROSS-TABULATION. The process of establishing the relationship between replies to various questions or between replies and questions and the factors that are relevant to the study.

DATA. Collections of facts or information. (Plural of datum.)

DEALER. A trader. Usually a retailer who sells direct to the final consumer.

DEALER SURVEY. A survey in which the dealer, or retailer, is questioned or observed.

DEMAND. The schedule of the amounts of a product that consumers would be willing to buy at all possible prices at any given point of time. It is the desire for the product backed up by purchasing ability and a willingness to use that ability.

DEPTH INTERVIEW. An interview during which the investigator probes the mind of the respondent in order to discover everything that he knows or thinks about a particular subject and endeavours to uncover the underlying thoughts or emotions of the respondent.

This type of interview is not normally conducted by means of a formal questionnaire; the investigator uses a list of points to guide him during the interview and allows the interview to proceed as a conversation though bringing the respondent back to the subject when he wanders away from the point.

DISPERSION. See Scatter.

DISTRIBUTION. (1) The economic function involved in the transfer of goods from production to consumption. (Used as synonymous with Marketing.)

(2) *In Statistics:* Distribution of a factor or variable—the way in which the factor or variable is dispersed throughout the universe or population.

EDITING. The process of examining completed questionnaires and coding them or otherwise preparing them for tabulation.

EXTERNAL RESEARCH. Research for which the sources are external to the concern for which the research is undertaken. There are

two divisions of external research; that for which the sources are published data, and original research among traders or consumers.

FIELD WORK. The work carried out by interviewers and supervisors among dealers in the case of trade research and among consumers in the case of consumer research.

FORECAST OF SALES. The volume of sales it is possible and desirable to achieve in a given forward period, taking into account market conditions and given a predetermined level of sales effort.

FREQUENCY. The number of times a particular value occurs in a series of data. Also Frequency Table—see Tables 1 and 2.

GRAPH. A method of illustrating statistical data by means of squared paper on which the data are represented by lines or curves.

HAND TABULATION. The process of sorting, grouping and counting data manually as opposed to mechanically. Hand tabulation includes the use of the hand-operated mechanical or electrical adding and calculating machines.

INFORMAL INTERVIEW. A form of depth interview used for obtaining information for the purpose of building questionnaires.

INFORMAL INVESTIGATION. A preliminary investigation used for the purpose of defining the problem in a research project where the true problem is obscure.

INTERLOCKING QUESTION. Questions in a questionnaire which are linked with one another or the answers to some of which depend on the answers to the others.

INTERNAL CONSISTENCY. The extent to which the answers to questions in a survey support one another.

INTERNAL RESEARCH. Research concerned solely with sources of information that are confined to the concern for which the study is being carried out, i.e. records and personnel.

INTERPRETATION. The process of giving meaning to statistical or other data resulting from research, in a form that enables the information to be used for commercial purposes.

INTERVIEW. The process of making personal contact with a respondent and obtaining from him answers to questions.

INTERVIEWER. The person who is employed to make contact with respondents and interview them.

INTERVIEWER BIAS. A systematic distortion brought about by the personality or manner of the interviewer in the presence of the respondent, the way in which he asks the questions or reports the results.

INTERVIEWER INSTRUCTIONS. Instructions given to the interviewer detailing the procedure to be adopted during the questioning, also incorporating the instructions that are included in the questionnaire form.

INVESTIGATOR. See Interviewer.

LEADING QUESTION. A question worded in such a way as to suggest an answer to the person being questioned.

MACHINE TABULATION. The process of sorting, grouping and counting data by the use of punched-card machines.

MAIL QUESTIONNAIRE. A questionnaire which is sent to the respondent and returned by him through the post.

MARKET. In the business sense this term usually refers to the aggregate demand of potential buyers for a product or service, e.g. the home market, the Canadian market, the small-car market.

MARKET ANALYSIS. A term used to describe studies, which are concerned with defining the size and characteristics of a market from business records and other sources. It is designed to show where, how and to whom a product is selling, and also what seasonal and other trends exist.

MARKET RESEARCH. A comprehensive term covering any form of research, internal or external, which is concerned with the gathering, tabulation and analysis of facts and information relating to the transfer and sale of goods and services from the producer to the consumer, involving the study of the relationships between production and consumption, the presentation of products, channels of distribution, the trade, the market, and the related financial problems.

MARKETING. Generally the term "marketing" is used to describe that function of business that is concerned with ensuring the production of the right product and with its transference from the factory to the consumer. It includes the selection of the method of distribution and the price policy. Thus marketing impinges on both production and sales and is a top-management function.

MEAN. The arithmetic mean or common average. (See also Average.)

MEDIA. A term used to describe collectively the various forms of vehicle which carry advertising or publicity. Type of media—press, poster, direct mail, etc. Particular media: *Daily Express*, *Daily Mail*, etc. (Plural of medium.)

MEDIA ANALYSIS. That part of market research which is concerned with evaluating the advantages offered by various publicity media in respect of a particular product. It may be concerned with the form of the media, such as press or poster, or may be concerned with a particular vehicle, e.g. the *Daily Express*. Although circulation is important, media analysis attempts to do more by evaluating the readership of each medium.

MEDIA RESEARCH. Research which is concerned with any form of advertising medium in its widest sense, including qualitative as well as quantitative assessment. (See also Media Analysis.)

MEDIAN. A form of average or measure of central tendency which is obtained by selecting the middle value in a series of observations. When the number of observations is odd, the median is that value which has an equal number of lesser and greater

values in the series. When the number of observations is even, the median is the value which is exactly between the two most central observed values.

MODE. A form of average or measure of central tendency obtained by selecting the most frequently occurring value in a series of observations.

MONEY INCOME. Income expressed in terms of £ *s. d.*, irrespective of its purchasing power. (See also Real Income).

NIELSEN INDEX. A specialised form of market research for the purpose of assessing the competitive position of branded products and carried out by auditing retailers' stocks and purchases, and based on a statistically correct sample of retailers. This service is provided by the A. C. Nielsen Company and is at present confined to foods, drugs and pharmaceuticals.

OBJECTIVE. That which is striven after or which it is desired to attain. In market research two kinds of objectives are recognised: the final objective, which is the ultimate purpose of a study; the intermediate objectives, which are the intermediate goals or steps leading to the final objective.

OBSERVATION. As opposed to question. A method whereby the investigator is placed in a position from which he can observe and note the actions and behaviour of respondents instead of questioning them. In normal question-and-answer interviews observation is used to a certain extent, e.g. for noting sex, age group, type of dwelling, etc.

OBSERVATIONAL TECHNIQUE. See Observation.

OPINION SURVEY. A survey designed to ascertain respondents' attitudes and opinions. Although market-research surveys often attempt to evaluate attitudes and opinions as regards matters relevant to the enquiry, opinion surveys are more common in public opinion research such as the Gallup Poll.

OUTLET. Usually refers to a distributor for a manufacturer's products, e.g. a wholesalers, or retailer or mail order house, etc.

PACK. Also Package. The immediate wrapping or container of a product, which is essentially part of the product and which is sold with it, refers to paper cartons, boxes, jars, bottles, etc.

PACKAGING. The preparation of the pack or package.

PANEL. A group of people questioned at regular intervals. (See also Consumer Panel).

PERSONAL INTERVIEWING. An interview where the investigator calls on the respondent as opposed to a telephone interview.

PILOT SURVEY. An exploratory survey which has two main objects: the provision of information on the various components of variability to which the material is subject; the testing of questionnaires, the development of field procedures and the training of investigators.

PILOTING. Usually, piloting a questionnaire, which is the process of testing a questionnaire on a small group for the purpose of ascertaining respondents' reactions to the questions and their wording to bring out flaws and enable them to be rectified before the survey proper is begun. (See also Pilot Survey.)

POTENTIAL MARKET. The aggregate of all those consumers who would be able and willing to buy a product, given the opportunity, hence in terms of quantity the amount that could be expected to be sold.

PRE-CODING. A technique whereby questions and answers are reduced to a numerical code on the questionnaire itself *before* a survey takes place and which thus enables the data to be transferred directly to a mechanical punched-card system without the intermediate step of coding questionnaires after completion. (See also Coding.)

PRETEST. Usually refers to questionnaires and consists of a first test to establish whether a questionnaire fully meets the purpose for which it is intended and whether it contains any flaws. (See also Piloting.)

PROBABILITY. The expectation of a certain result based on past experience. Statistically—the measure of that expectation.

PROBABLE ERROR. The error which it is estimated likely to occur for a given sample before that sample is actually put to the test.

PROBING. Searching by questioning for the thoughts which underlie the respondent's superficial answers. (See also Depth Interview.)

PRODUCER. A term applied to persons and undertakings engaged in the extraction, processing or manufacture of commodities, as opposed to those engaged solely in distribution. Also producers of services.

PRODUCT-TESTING. A specialised form of market research concerned with measuring the market's reactions to a new product or to proposed changes in an existing product.

PUBLICITY. See Advertising.

PURPOSIVE SAMPLING. See Quota Sample.

QUALITATIVE DATA. Data which provides reasons for certain situations or evaluates in terms of attitudes or opinions respondents' reactions, as opposed to purely numerical measurements.

QUANTITATIVE DATA. Data which expresses respondents' reactions in purely numerical terms, e.g. the number of times a product is bought, the quantity absorbed by the market, readership. Qualitative data can also be expessed quantitatively, e.g. the number of respondents holding a certain opinion.

QUESTIONNAIRE. A list of questions organised in a particular way for the purpose of a market survey.

QUOTA. (1) The quantity of business allotted to a particular sales area or salesman's territory as expressed in a sales budget.

(2) The number of interviews of a particular kind allotted to an interviewer, e.g. the number of interviews to be obtained with class A–B housewives.

QUOTA SAMPLE. A sample which is broken down into quotas according to the factors it is intended to use as controlling factors and in accordance with their incidence in the universe.

RANDOM SAMPLE. A sample which gives an equal change of selection to every item in the universe. Purely random as opposed to quota or controlled samples.

RATIO. The relationship of one quantity with another, expressed as a fraction.

RATIONALISATION (OF PRODUCTION). Also known as product simplification. The process of reducing the varieties of goods in a product line to those which are economical propositions by relating them to the demand for them.

RAW DATA. Data before analysis. Before it is organised.

READERSHIP. Readership of any particular advertising medium is the number of people who read that medium and is not necessarily related to its circulation. For example, one copy of a publication may be read by a number of people apart from its original purchaser as would occur with publications in a hairdresser's salon.

REAL INCOME. Income expressed in terms of what it can buy as opposed to its money value. (See also Money Income.)

RELIABILITY. (1) *Of response:* The consistency of replies to question in a questionnaire.

(2) *Of the sample:* The extent of the inherent error in the sample.

REPRESENTATIVENESS. The extent to which a sample is a true miniature of the universe from which it is taken.

RESPONDENT. The individual who replies to a questionnaire whether by mail, telephone or personal interview. Also in depth interviews.

SALES ANALYSIS. The breaking down of sales figures by products, areas, customer types, salesmen, etc.

SALES BUDGET. A statement of expected sales income and sales expenditure, showing on one side the sales forecast for a future period and on the other the expected cost of achieving the anticipated sales.

SALES PROMOTION. Any steps that are taken for the purpose of obtaining or increasing sales.

Often this term refers specifically to selling efforts that are designed to supplement personal selling and advertising, and, by co-ordination, help them to become more effective.

SALES QUOTA. A salesman's objective in terms of the quantity he is expected to sell. (See also Quota.)

SAMPLE. A section of the universe which is selected in such a way as to be a properly representative cross-section.

SAMPLE MAKE-UP. The composition of the sample in terms of the characteristics present in the universe.

SAMPLING. The process of using a relatively small cross-section of the universe for the purpose of ascertaining facts applicable to the total universe—this term also refers to the method by which the sample is chosen—random, area or quota sampling.

SAMPLING ERROR. The statistical error which is present in a particular sample and which can be ascertained in respect of a particular question once the pattern of replies to that question is known.

SCATTER. The way in which the different values of a variable lie about their average or mean. Also Dispersion.

SEASONAL TREND. Changes in the volume of sales of a product corresponding to certain times of the year, which may be general or may refer to individual markets or areas.

SERIES. A set of observations in statistical analysis.

SIGNIFICANCE. Usually the significance of difference. A difference occurring between two results in sampling is said to be significant if its existence cannot be attributed to chance errors involved in the sampling process.

SOCIO-ECONOMIC GROUPING. The method of dividing a population into groups representing the various social and economic levels. The income and status of the head of a household are usually the criteria by which it is classified into one or other socio-economic group. (See also Stratification.)

STABILITY. Of a group, is the degree to which that group is liable to change. Normally the larger the group the more stable it is likely to be as a whole.

STANDARD. A situation or measurement which is accepted as normal and which can be used as a measure of the effectiveness of other situations or measurements of a similar nature.

STANDARD DEVIATION. A measure of the scatter of a series, i.e. the average by which the values deviate from their mean.

STANDARD ERROR. The inherent variation of a sample or of answers to a particular question, which is measurable and dependent on the size of the sample and the pattern of replies to questions.

STATISTICAL RELIABILITY. The degree of error present and which is measurable for any question in a sample survey. This is a measure of the statistical reliability of the sample.

STRATIFICATION. A method of dividing a universe into strata, that is into groups representing the possession of various characteristics and in various degrees, e.g. income groups, age, sex, educational standard, etc.

STRATIFIED SAMPLE. See Quota Sample.

SUB-SAMPLE. Part of the whole sample, e.g. a sub-sample representing the 30-50 age group in a total sample covering all age groups.

SUPERVISOR. A person who is entrusted with the task of supervising and checking the work of interviewers in the field.

SUPPLY. The schedule of the quantities of a commodity that would be made available at various price levels.

SURVEY. An enquiry which is concerned with the collection of data in relation to a total universe. A survey can be of two kinds:

(1) A census survey in which every item in the universe is considered.

(2) A sample survey, in which only a sample of the items in the universe is considered but where the results are related to the total universe.

TABULATION. The process of sorting, listing and counting the answers to questions.

TELEPHONE INTERVIEW. An interview conducted by telephone as opposed to a personal call or a postal questionnaire.

TEST INTERVIEWING. Interviewing a small number of respondents for the purpose of testing a questionnaire and ascertaining whether it contains any flaws. (See also Piloting.)

TEST MARKET. An area which is isolated as far as possible from other areas and which is used for testing a new product, package or advertising appeal, or a particular marketing factor.

TRADE RESEARCH. Research which is conducted among traders, i.e. among factors, wholesalers, retailers.

TREND. The direction in which a situation is moving, e.g. a continuous 5 per cent upward trend in sales.

TURNOVER. (1) *Cash Turnover:* The income of a business concern measured over a period, usually a year.

(2) *Stock Turnover:* The number of times stock is sold and replaced over a period.

UNIVERSE. The total number of items which are relevant to an enquiry, e.g. the total population, all housewives, all motorists, medium-income housewives only, all chemists in the London area, etc.

VALIDITY OF SAMPLE. The extent to which a sample truly represents the universe from which it is taken, i.e. the extent to which it possesses the same characteristics in the same degree.

WEIGHTED AVERAGE. The average of numbers which have been previously individually increased or decreased in order to give them their true importance in relation to each other.

WEIGHTED SAMPLE. A sample in which small sub-samples are increased arbitrarily to permit of their statistical analysis, the results being "weighted" during tabulation in order to bring them back to their true values.

WEIGHTING. The process of giving numbers their true values according to their individual importance.

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