PRINCIPAL INTERNAL METHODS OF
FORECASTING THE STOCK MARKET

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PRINCIPAL INTERNAL METHODS OF
FORECASTING THE STOCK MARKET

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CHAPTER I

THE PROBLEM AND DEFINITIONS OF TERMS USED

Differences of opinion have existed, for many years, regarding the possibility of forecasting the stock market. Those believing that it is possible to make predictions of future movements are divided into two groups: the ones using general economic conditions upon which to base their forecasts and the others who believe that the market itself will reveal its future action by means of the stock prices and the volume of shares traded. There has been no recent presentation of the case for forecasting the stock market nor examination of the principal "Internal" methods which are employed.

I. THE PROBLEM

Statement of the problem. It was the purpose of this study (1) to present some claims which purport to be successful in forecasting stock prices; (2) to examine the claims that the market, itself, is best able to indicate its own future movements; and (3) to apply the principal methods to the current market to see how well they worked.

Importance of the study. The problem of forecasting which has most intrigued the interest of economists, as well as many individuals, is that of predicting the movement of stock prices. Since much of our economic well-being depends upon business activity and since stock prices must be related essentially to the action of business, it is
but natural that those elements which influence this fundamental economic
time series should have been subjected to careful and systematic scru-
tiny.

An important area of investigation, then, would be to examine
the major approaches to the problem of forecasting stock prices and
see what progress is being made, if any.

II. DEFINITIONS OF TERMS USED

External or fundamental methods of forecasting. Fundamental
market conditions are those economic and political factors outside
the market itself which dictate market trends, either for the individual
stocks or for all stocks as a group. Throughout this report, therefore,
fundamental or external methods of forecasting shall be interpreted as
meaning those methods of forecasting which seek to ascertain the future
market movements by examining the forces outside of or external to the
market. Those methods seek to find the intrinsic value of the stock
or what is considered their real worth. Inasmuch as fundamental con-
ditions change slowly, the primary viewpoint is for the long run.

Internal or technical methods of forecasting. Technical factors
or conditions are those which arise in the market itself, as contrasted
to fundamental conditions which develop outside of the market. They
are due to the activities of professional, speculative interests for
the most part and not those of long-term investors. Technical condi-
tions develop because of the activities of short-term traders who seek
to take profits on minor or secondary fluctuations in the market.

Therefore throughout this report technical or internal methods of forecasting shall be interpreted as meaning those methods of forecasting which seek to ascertain the future market movements by examining the movements which arise within the market as indicated by the number of shares traded and the prices paid for them. The primary viewpoint is for the short run.

III. ORGANIZATION OF REMAINDER OF THESIS

The method of the thesis was to reaffirm the importance of economic forecasting and show that one of the most suitable areas for investigation is the stock market.

Previous investigations have shown a pronounced lack of success in the field of forecasting the stock market. Inasmuch as those investigations are all more than six years old and the most thorough one reported its results in 1944, it was considered worthwhile to examine the modern approaches to forecasting. 1

A study of the case for scientific analysis of the stock market was made and the conclusion reached that stock prices are an economic time series containing a certain amount of inertia which results in the market or a stock having trends. Furthermore, regular cycles have been detected which leads to the theoretical possibility of making

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predictions about future movements with the expectation of a degree of success.

The next step was to examine the two principal methods of dealing with the stock market, external forecasting and internal forecasting. Since existing data has shown that market movements precede the significant movements in other time series, it was concluded that any method of successfully forecasting the stock market must necessarily be an internal method.

After establishing that internal analysis has the best chance for success in forecasting, it was ascertained that two major divisions existed. One group makes no attempt to forecast; rather, all of its efforts are devoted to an early detection of the trend of stock prices and, by making use of the fact that there is a certain inertia in stock prices and that once a trend is established it will continue for a period of time, they attempt to follow this trend. The other group, by means of charts and various ratios, seeks to measure the forces of supply and demand and from this reach various determinations about the future of stock prices. This is necessarily a short-term proposition because fundamental factors will dominate the long-term price of a share of stock.

The primary purpose of the thesis was to study these two groups and how they deal with the movement of both the market and individual stocks.

Since it was not possible to adequately test all of the methods
employed to determine their validity, a carefully selected representa-
tive number were utilized in order to see if they would have been of
any value to a trader or investor in the preceding year.
CHAPTER II

REVIEW OF THE PROBLEM

The history of economic forecasting is replete with failures. This is in striking contrast with the physical sciences, where failure is the exception rather than the rule. The fact that predicting the future is so often more difficult and more hazardous than explaining the past does not mean that attempts at prediction are unjustified. Presumably the search for explanation of past events, a pursuit in universal good standing, springs in large part from the desire to look forward more wisely.

A variety of reasons exist for the inability of economic forecasting to be as exact as the forecasting in the physical sciences.

One problem is the possible effect of the prediction itself upon the course of events with which the prediction is concerned. A business forecast by a service which is widely read may result in such a change in the plan of business executives as to rob the forecast of much or all of its value. A prediction might be acted upon so promptly and so generally that few business units would be able to reap advantage by following the advice. From the viewpoint of individual self-interest, the value of a forecast depends upon its not being generally acted upon or, at any rate, not promptly.

More complicated than the problem of possible effect of a service's own forecast, is the question of the possible effects of other predictions.
not yet disclosed but which are about to be issued by competing services. Still more direct in their significance, and probably more far-reaching in effect, are the independently formulated forecasts of business managers on the basis of which these executives are about to act.

One is not warranted in insisting that successful forecasting is inherently impossible. However, one may grant the possibility that a measure of success may some day be achieved in forecasting and yet remain skeptical of current forecasts on the grounds that the body of theory thus far developed is too inadequate, the present analytical techniques too limited, or the relevant information too fragmentary.

If little is known, as yet, concerning the factors responsible for business fluctuations, then forecasts can hardly be made with confidence on the basis of causal analysis. If such sequences as have been discovered do not exhibit a considerable degree of regularity, one cannot rely upon the method of historical comparison. Even if there has been regularity for a time, one cannot judge how much reliance to place upon its persistence if he does not understand the reasons for its occurrence. Furthermore, one cannot apply intelligently such knowledge as he has concerning theory or sequences unless he has information as to the facts of the current situation and some technique for handling quantitative data.

I. IMPORTANCE OF ECONOMIC FORECASTING

Forecasting is a necessary part of economics. Perhaps one of
the most difficult and one of the most important problems confronting the science of econometrics is that of the analysis and the interpretation of time series. There exist some permanent structures in economic time series and it is upon the recognition of these structures that success in forecasting must ultimately depend. The problem then resolves itself into the possibility of separating the random element from the structural component.

This preliminary problem, once solved, leads immediately into the more complex one of discovering valid interactions of one time series with another. Upon the discovery of such relationships the hope of establishing a firm science of economics inevitably rests. From them, there will come ultimately the power of prediction, which is the final test of any mature science.

Many ingenious devices have been suggested for the solution of this problem, but, unfortunately, no conspicuous success has attended these methods of forecasting.

Greatest efforts made to forecast the stock market. Perhaps the most sturdily assailed problem in economics is that of forecasting the movement of the prices of stock. The primary reason appears to be the unlimited wealth which would accrue to the fortunate forecaster. However there are other important ones which should be considered. Alfred Cowles, who has devoted years to studying the results achieved by various forecasters, gave as his reason:
It seemed a plausible assumption that if we could demonstrate the existence in individuals or organizations of the ability to foretell the elusive fluctuations, either of particular stocks, or of stocks in general, this might lead to the identification of economic theories or statistical practices whose soundness had been established by successful prediction.  

Another reason would be the tremendous effect that business conditions have on the lives of people. A number of cycle studies have revealed that stock prices turn ahead of various other indicators of business conditions. Therefore prediction of stock prices could provide an earlier indication of turning points in the business cycle and steps could be taken to soften the effects.

Another point to keep in mind is that fluctuations in stock prices can influence business conditions. Regardless of the cause of the movements, the effects on business can be observed. Price levels make people "feel" richer or poorer, and affect their willingness to spend, or desire to save. Luxury sales are particularly sensitive to stock price changes. Rises in the prices of securities increase the borrowing power of stockholders, and thus additional money may be spent. The business man's plans are influenced by stock price movements, and therefore the pace of his forward commitments. New financing is dependent upon the prevailing stock market atmosphere. Plant expansions,

1Alfred Cowles, "Can Stock Market Forecasters Forecast?" Econometrica, I (July, 1933), 309.


There is a vast amount of material available concerning the various attempts to forecast the stock market. Many different approaches have been tried and discarded. From these a few have evolved and, while not being conspicuously successful, were not conspicuously unsuccessful.\footnote{See Garfield A. Drew, New Methods for Profit in the Stock Market (Boston: Metcalfe Press, 1948).}

In addition, new and current data in a convenient and readily accessible form is continuously coming forth to allow for current testing of the theories and to assist in developing new ones.

II. FAILURE OF PREVIOUS METHODS OF FORECASTING

Conclusions of previous investigations. Before proceeding further, it is both interesting and important to ask the question whether or not professional agencies, with all the careful technical investigation which they have made of this problem, have attained any measure of proficiency in forecasting the action of stock prices. Such a study of the forecasting powers of professional agencies was made by the Cowles Commission for Research in Economics for the following groups and periods:
1. Sixteen leading financial agencies over four and one-half years ending July 1932. This analysis included about 7,500 separate recommendations requiring approximately 75,000 entries.

2. Twenty leading fire-insurance companies from 1928 to 1931, inclusive. This analysis considered the common-stock investment of the companies representing between twenty and thirty per cent of their total investments.

3. Twenty-four financial publications over four and one-half years ending May 1932. Approximately 3,300 forecasts were tabulated in this study.

The Commission's conclusions may be summarized as follows:

1. The recommendations of the sixteen financial services were compared with "--the gain or loss of the stock market for the identical period." Cowles did not say how he measured this gain or loss; however, he used the Standard Statistics Company index of ninety representative stocks in examining the success of the twenty-four financial publications and it is possible that he either used this average or a similar one to measure the success of the sixteen financial services and of the twenty fire insurance companies as well.²

The comparison disclosed that the sixteen financial services compiled an average record that was worse by 1.45 per cent annually

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¹Cowles, "Can Stock Market Forecasters Forecast?" p. 310.
²Ibid., p. 316.
than that of the average common stock. Statistical tests of the best individual records failed to demonstrate that they exhibited skill and indicated that they more probably were results of chance.

2. The investment departments of the twenty fire-insurance companies achieved an average record 1.20 per cent annually worse than that of the general run of stocks. The best of the records fails to exhibit definitely the existence of any skill in investment.

3. The investment recommendations of the twenty-four financial publications was compared with twenty-four records, identical with those of the financial publications as to the total period covered, but having purely chance advices applied to random intervals within these periods. This disclosed that the twenty-four financial publications failed as a group by four per cent per annum to achieve a result as good as the average of all purely random performances. A review of the various statistical tests applied to the records, for this period, of these twenty-four forecasters, indicates that the most successful records are little, if any, better than what might be expected to result from pure chance. There is some evidence, on the other hand, to indicate that the least successful records are worse than what could reasonably be attributed to chance.¹

In a supplement to the original study published eleven years later in 1944, the results of a statistical and analytical study of

¹Ibid., pp. 323-324.
the records of eleven of the leading forecasters of stock market fluctuations for the past forty years was disclosed. The conclusions are summarized: (1) The records of eleven leading financial periodicals and services since 1927, over periods varying from ten to fifteen and one-half years fail to disclose evidence of ability to predict successfully the future course of the stock market. (2) Of the 6,904 forecasts recorded during the fifteen and one-half year period, more than four times as many were bullish as bearish, although more than half of the period was occupied by bear markets; and stocks at the end were at only about two-thirds of their level at the beginning as measured by the Dow Jones industrial average. (3) The record of the forecasting agency with the best results for the fifteen and one-half years since 1927, when tabulated back to 1903, for the forty years showed results 3.3 per cent a year better than would have been secured by a continuous investment in the stocks composing the Dow Jones industrial average.

Under the present laws the capital-gains tax might wipe out most of this advantage.  

On August 26, 1946, the Dow Jones industrial average was 197 and by November 22 it had dropped to 163. Some time after this serious break in the market, the Securities and Exchange Commission examined all of the investment literature, letters, and wires which had been sent out by the investment profession during the week of August 26 to

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September 3, 1946, just before the market crash. Hundreds of pieces of literature and wires were reviewed. Some were inconclusive and are therefore omitted from these figures. Definitely bullish were 346 professional opinions, while 20 were bearish or advised selling part of equity holdings; that is, 94.24 per cent were bullish, 5.76 per cent bearish, right at the top of a notable bull market, and only days from the most precipitous break in nine years. 1

Barrons published an article by A. J. Cortese examining the value of all the Dow Theory signals over the past fifty years. He concluded that the performance of the price movement had given twenty-six authentic signals in that period, that is, signals that indicated buying or selling action for the investor, and that thirteen of the signals had been reliable and thirteen deceptive. 2

Even worse were the results revealed by J. A. Livingston, an economist for Business Week magazine and the financial editor of the Philadelphia Record, who made his own personal survey of investment counselors. Mr. Livingston revealed: (1) During a five and one-half year period dating from June 1946, one group of economists and/or financial forecasters was wrong in market predictions two out of three times. (2) At the beginning of 1953, when the Dow Jones industrial average

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was 290, the forecasters varied amazingly in regard to what the future held. One analyst predicted that the average would rise to 500 by 1984; another said it would drop to 140. The Dow Jones industrial average actually ended on December 31, 1953, at about the same level as it started on January 1, 1953.¹

Lord Keynes noted that there would probably always be many buyers and sellers who have little or no information on which to base their decisions and they would buy or sell on their own or other people's hunches. So much of this uninformed or naive trading was observed by him that he was led to regard trading in the stock market as a "game of Snap, of Old Maid, of Musical Chairs—a pastime in which he is victor who says Snap neither too soon nor too late, who passes the Old Maid to his neighbor before the game is over, who secures a chair for himself when the music stops."²

**Results of Investigations.** Such studies and conclusions have naturally led many to at least the tentative conclusion that the pattern of stock prices is random, reflecting the hopes and fears of the mass of investors, as these are modified by outside shocks, such as wars, political upheavals, and various random events.³


³A. Wilfred May, "Is It Possible to Forecast the Stock Market?" *The Commercial and Financial Chronicle*, CLXII (December 28, 1950), 5 and 24-25.
A growing body of thought has developed denying any possibility of success in forecasting or else that it is not possible for the average investor to do so. This has led to various alternative approaches to the problem of timing stock purchases.1 Many investors have gone over to using various types of formula plans which have been developed or have even gone further into dollar averaging, and abandoned completely the problem of timing stock purchases with the thought that it is impossible.2

III. THE CASE FOR SCIENTIFIC STOCK MARKET ANALYSIS

With this growing body of opinion that any attempt to forecast the stock market is predestined to fail, it is important, therefore, to examine the arguments for a scientific analysis of the stock market and see if they rest on a sound basis or if forecasting is merely a modern attempt to "turn base metals into gold."

Successful forecasting depends on the composition of prices. If the stock prices are nothing more than a series of haphazard or random numbers which arise from chance alone, such as might be derived from consecutive tosses of a coin, it would be useless to study any previous

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price patterns because they would indicate nothing about future movements.

If stock prices should appear to have some form of structure, such as most economic time series contain, then it should be possible to analyze them and come to some sort of conclusions. Legitimate areas of investigation would be to study the trend, particularly in an increasing economy, and cycles, the more or less regular variations about the established trend. Naturally these movements would not be entirely regular since the vagaries of human conduct might be expected to alter both their amplitude and their periods. But if a genuine cycle is to be observed, this variation should be within well-defined limits of statistical error.

Factors affecting stock prices. To aid in the determination of the composition of stock prices it was necessary to examine the principal forces which affect the movement of them. To simplify the analysis the forces were divided into two groups: one, the group of economic forces; two, the group of noneconomic forces.

The economic forces run in the thousands, classifiable under such headings as money, taxes, prices, wages, sales, profits, innovations, foreign trade, and so forth. All economic forces carry one supremely important power, the power to affect the earnings of the corporation, which in turn will affect the dividends that the corporation will pay.
Of the two, earnings are more important than dividends. Earnings are of interest to both speculators and investors, whereas dividends are of interest primarily to investors.

The noneconomic forces consist of thousands of forces also. Again, for purposes of simplification and of proper organization, they were divided into psychological and nonpsychological. This division and classification was made in accordance with the concepts of popular psychology or the nonscientific or common sense psychology as opposed to the academic psychology of the class room. The main reason is, of course, that very little has been done by recognized psychologists in studying and classifying the various types of investors and speculators.¹

¹For a brief discussion of speculative psychology, see Floyd F. Burdette, Investments and Investment Policy (New York: Longmans, Green and Company, 1933), pp. 653-661.
The psychological forces are accordingly of tremendous importance. A very large portion of the action of the market can be explained only in terms of psychological forces. An economic-psychological force represents the deviation in the action of real men from the action of the rational men conceived by many economic schools.

At the present time four psychological forces have been identified as pertaining to the market. There are probably others, but the four are: The Exaggeration Compulsion, Fear Negative and Fear Positive, Fixation, and Reality and Deceit.¹

These are not listed in the standard psychology texts, but a reasonably good non-scientific explanation has been attempted by Flumiani. In essence he maintains that the exaggeration compulsion is a psychological force which has a tendency to magnify the effect upon the market due to the incidence of the economic forces alone. Economic forces, expressed eventually by earnings reports, move the market in certain directions. The psychological then steps in and accentuates the pressure and ensuing action due to the economic. The result is that the market will be better or worse than the level of prices justified by the presence of the economic forces alone.²

His classification lists two types of fear which affect the


²Ibid., pp. 13-14.
market, the negative fear and the positive fear. The negative fear is the fear of suffering monetary losses. The positive fear is the fear of not realizing possible profits.

Fear tortures all traders. It tortures them while they are out of the market and while they are in the market. While they are in, they are afraid that the market may change its course suddenly and run against them. They know that when the market declines, it moves down much faster than when it advances. At the first sign of a decline, all traders want to get out of the market at the same time.

Fear also hits the inactive traders, those who choose to stay on the sidelines and do nothing but wait and look and think. These traders suffer from the positive fear, the fear of not realizing possible profits by staying out of the market, by preferring inactivity to activity. They may wait so long that they are squeezed out; so long that it may eventually become too late to do anything.¹

Flumiani believes that fixation is another important psychological force evident among traders. By fixation it is meant the inability of traders, active or inactive, to entertain the possibility of a change in the course of the market. Having chosen a certain position, they remain fixed to it while the market often does indeed change and leaves them behind. When the market climbs to higher and higher levels, traders are inclined to regard that climbing action as if it were destined to

last forever. The same applies to a declining market. Fixation with a climbing market is a case of wishful thinking. With a drastically declined market, it is a case of despondency and hopelessness.¹

Reality and Deceit is nothing else, according to Flumiani, but the irresistible attempt to personalize the market action; the imperious projection of oneself into the mechanism of the market. This is a pathological condition of the average trader. A trader should be able to consider the market objectively as an entity separated from himself. Many are not able to do that.

Men speculate in the market for the prestige they feel it brings them, for the daily interest of following fluctuating market prices, and possibly to escape from the reality of daily living.

The result is that buying and selling are not done along rational lines, but on utterly capricious and irrational ones. Stocks are bought because of their names or because of an uncritical analysis of industrial potentials.

Included in this group are the emotionally despotic individuals, those who expect the market to do not what it does, but what they want the market to do. They expect higher prices and they command the market to go higher. They want that half a point up or down and so they order the market to act and when the market refuses to obey them, it is not they who are wrong—but the market!²

¹Ibid., p. 15. ²Ibid., pp. 15-17.
All of these forces combine to make up the two basic actions of the stock market. The action based on individual securities and the action based on the market as a whole. These are the actions which result in discernible trends and measurable cycles.

**Summary of the case for scientific analysis.** Critics often refer to the fluctuations of the stock prices as a chance series like those derived from tossed coins or dice. Therefore any research into the internal structure of price movements is useless. Probably the most extensive investigation of this general thesis was made by the Cowles Commission for Research in Economics. Their conclusion was that the pattern of stock prices could not be shown to be random nor was the pattern likely to have arisen from the cumulation or summation of a random series. The pattern of the stock market was found to have nonrandom structure both on short-term, hourly and weekly bases and annually.¹

Among the different viewpoints from which this problem may be approached are those which consider (1) the element of inertia, and (2) harmonic analysis for the purpose of disclosing evidence as to regular periodicity. Inertia is the property of matter by which it will remain at rest, or in uniform motion in the same straight line

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or direction unless acted upon by some external force. Harmonic analysis is a mathematical technique for analyzing any curve, no matter how complicated it may be, into its constituent simple sine curves.

Evidence of inertia may be disclosed in the following manner. In a penny-tossing series there is a probability of one-half that tails will follow heads and vice versa. If the stock market rises for one hour, day, week, month, or year, is there a probability of one-half that it will decline in the succeeding comparable unit of time? In an attempt to answer this, by Alfred Cowles III, sequences and reversals were counted. A sequence occurs when a rise follows a rise, or a decline a decline, and a reversal occurs when a decline follows a rise, or a rise a decline.¹

A study of the ratio of sequences to reversals will disclose structure as defined above, if it exists within the series, and the significance can be defined by ordinary statistical methods. For instance, the probability can be determined that any ratio occurred by chance, from a random population of price series. Also, from the frequency distribution of these ratios, one can estimate the probability of success in forecasting a rise or decline in stock prices.

Samples of adequate length, where available, were examined by Cowles. The intervals between observations being successively 20 minutes,

1 hour, 1 day, 1, 2, and 3 weeks, 1, 2, 3, . . . 11 months, 1, 2, 3, . . . 10 years. It was found that for every series with intervals between observations of from twenty minutes up to and including three years, the sequences outnumbered the reversals. As a result of various considerations, such as trading expenses and taxes, it appeared that a unit of one month was the most promising from a forecasting viewpoint. In the case of the 100-year monthly series of common stock prices, which was examined, covering the years from 1836 to 1935, a total of 1,200 observations, there were 748 sequences and 450 reversals. That is the estimated probability was 0.625 that if the market had risen in any month, or if it had fallen, that it would continue to fall for another month. "The standard deviation for such a long series constructed by random penny-tossing would be 17.3, therefore the deviation of 149 from the expected value of 539 is in excess of 8 times the standard deviation. The probability of obtaining such a result in a penny-tossing series is infinitesimal."¹ "The significant excess of sequences over reversals for all units from 20 minutes up to 6 months . . . represents conclusive evidence of structure in stock prices."²

"A simple application of the 'inertia' principle, such as buying at turning points in the market after prices for a month averaged higher, or selling after they averaged lower, than for the previous month.

would have resulted in substantial gains for the period under consider-
ation.

A reasonable explanation of the excess of sequences over reversals is that changes in the world, such as inflation, deflation, wars, and taxes produce extended swings in stock prices. It is likely that the excess of sequences found in the Cowles study is merely a way of expressing the fact that there are major trends in stock prices that persist over extended intervals.

It is also possible that even though these major trends are the result of changes in the world, that the pattern of change is a matter of probability. This is to say that if the market is destined to decline forty per cent that fact is not a matter of mere chance, but the pattern of decline may be a matter of chance.

Doctor O. K. Burrell, of the University of Oregon, tested this hypothesis by the comparison of charts of significant rises or declines in stock prices with charts constructed to yield almost exactly the same total change, but where the pattern of movement was based on pure chance. These charts were given to a group of five mathematicians for analysis. They expressed the following: "Our conclusion is that even fairly short run stock price movements are not random."2


Professor Harold T. Davis, a statistician and economist from Northwestern University, made an analysis of the Dow Jones industrial averages for the period from 1897 to 1913 using the monthly closing prices. He stated the following: "These observations have led to the conclusion adopted by most students of the business cycle that there is a genuine cycle of period close to 40 months in industrial stock prices together with the possibility of periods of less permanence around 20 and 60 months."¹

In a further analysis of the Dow Jones industrial averages, from 1914 to 1924, Davis used a periodogram in his studies. This is a curve exhibiting graphically the periodicity of any natural or physical phenomenon. He stated: "The conclusion is inescapable that the 40 month component in the years from 1914 to 1924 was a very dominating pattern of the stock price series and large profits could have been made by forecasting with this single cycle."²

In other words, despite the Cowles study on the records of stock market forecasters and the Keynes' theory, there ought to be a rational explanation of stock prices; and if the rational explanation of past stock market changes could be achieved, successful forecasts of stock prices by scientific methods ought to be possible.

If a great many traders in common stocks, possibly a majority, know little about their stocks or why prices should go up or down, and

¹Davis, op. cit., p. 290. ²Ibid., p. 292.
if professional groups have not been able to turn in good records, why then is the pattern of stock prices not random? The answer is that the informed few generally determine the market trends, because the average expectations of the guessers is zero. Suppose, for example, that there are 1,000 equal traders of a particular stock and that 900 merely toss coins to determine whether they should buy or sell. Suppose that the other hundred are informed as to condition and act in accordance with this information, and with proper interpretation of what it means for the future. Then, if conditions are improving, there will be about 550 buyers and 450 sellers and share prices will improve. Contrariwise, if conditions are deteriorating, there will be about 550 sellers and 450 buyers and the trend of prices will be downward. The actual balance would not be as precise as has been indicated since there would usually be chance deviation from the average expectation. Moreover, large traders would influence the short-term trends of prices; and the market from time to time would be subject to outside impacts which give bias to the decisions of the guessers. Nevertheless this serves to illustrate how a small group of careful traders could operate to cause definite trends in the stock market.

In view of the preceding analysis of stock prices and the factors which cause them to fluctuate and of the conclusions reached by eminent statisticians and economists who have made careful, scientific studies of the nature of stock prices, the conclusion is unavoidable that stock prices have a structure that it should theoretically be possible to forecast.
CHAPTER III

MODERN APPROACHES TO THE PROBLEM

I. MAJOR TYPES OF FORECASTING

There are two major approaches to the problem of forecasting the stock market: the external or fundamental method of forecasting and the internal or technical method. Both have various subdivisions which have been developed by their followers.¹

External forecasting. In the external or fundamental method of forecasting, the main concern is the broad economic trend. It considers bank clearings, interest rates, commodity prices, production, purchasing power, and political and foreign situations. In determining which particular stock to buy, use is made of statistical factors relating to individual groups of stocks, such as the steels, oils, autos, and so forth, or individual stocks in a group. This requires study of balance sheet items, the relation between gross and net earnings, profits and losses, assets and liabilities as compared with other companies. Thus the fundamental approach is the study of economic and statistical factors which are the causes which influence the price trends of the general market and of the individual stocks.²

¹Edmund W. Tabell, "Market Forecasting," The Commercial and Financial Chronicle, CLXVII (March 11, 1943), 1 and 34.
²Ibid.
Fundamental factors are slow moving. They are so important that they practically rule the eventual trend of stock prices but, because they generally start slowly and act slowly, their effect upon prices is likely to be similarly slow. Fundamentals are more in consonance with long-term movements than with the intermediate swings.

There have been many exhaustive searches for some economic indicator or index of business which would fluctuate regularly ahead of stock prices and serve to forecast it. Such a search was conducted by two professors of Emory University in Atlanta, Georgia: Charles Cottle and W. Tate Whitman. They compared the turning points of the Dow Jones industrial average and the Federal Reserve Board Index of Industrial Production for the period from 1919 to 1940. In this period the time differential ranged from a stock price lead of 300 days to a lag of 186 days. Not only did an unstable relationship exist at the turning points but there was marked disparity also in the magnitudes of the fluctuations of the two series. They concluded: "Because the movement of common stock prices has frequently led the upswing and downswing of the business cycle, it is questionable whether the turning points in the securities market can be forecast by fluctuations in any general barometer of business activity."¹

A study was made by Harold T. Davis, in connection with the Cowles Commission, of the lag correlation of thirteen important economic

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time series over the period from 1897 to 1913. This period was selected because of the unusual stability of the trends which made it an especially good range for exploring the interdependence of economic series. The following results were revealed:

One of the conclusions which we may reach by a study of the correlation table is that no economic series in the list forms a significant forecasting series for the behavior of stock prices. This fact is sufficient to account for the failure of all attempts to make a forecaster for the action of the stock prices as a whole. Therefore, since no economic series can be employed to forecast stock prices, other methods must be employed.

It is becoming generally recognized that, rather than business serving as a forecaster for the stock market, the stock market serves as a forecaster for business. It is the upturn from periods of depression which lends credence to the theory that the market forecasts business future. Evaluations of stock prices present indices of the business conditions. As a rule, stock prices tend to precede a change in business conditions, and by stock prices and indices of the prospective financial analysts on Wall Street:

In the twenty-six major reversals of the past ninety years, they have lagged in only five cases, one of these being in 1942 when the impact of war obviously had changed the normal relationship. The time of anticipation by the market in the other twenty-one instances varied between two and six months. Along these same lines the National Bureau of Economic Research listed eight series of economic data that have most consistently

anticipated cyclical revivals and recessions. Included among them is the industrial common stock price index. The hazards in judging the soundness of the market at any given time results in part from serious statistical gaps in our knowledge of the influences believed to affect the market. But an even greater difficulty arises from an inability to evaluate the relevant importance of the factors that may affect stock-price movements. The analyst of stock market behavior may review a wide variety of statistical data showing changes in the volume of business, earnings, dividends, bank credit, taxes, governmental policies, and so forth. This information, generally speaking, technical or statistical analysis is based, however, is applicable in the main either to the current situation or upon the principle that the market is made up best returner and that to the past.

The varying demand and supply of stocks will be a larger trend pattern.

Stock market behavior is peculiarly concerned with discounting the market's future moves. It requires a vast amount of sales in the future. Fluctuations of stock prices presumably reflect the changing data we evaluate the relative strength of the buying and selling anticipation by stock purchasers and sellers of the prospective pressures which cause the fluctuating willingness to buy or willingness volume of business, the prospective earnings, and the like. With respect to these anticipations, however, current and past statistical records may be only of limited usefulness. Moreover, where judgements of the future are concerned, psychological, as distinct from economic, influences may play a highly significant role. However, despite the

waves of optimism and pessimism which may characterize stock market behavior generated by uncertainties of the future, the analyst will not readily dismiss such statistical information as has been built up in the past, and which is believed to be relevant in judging future stock-price trends. It was with the failure of the ordinary business "barometers" as known in 1929-32 that it came to be recognized that the stock market itself is its own best barometer on the logical ground that the price movement represents the sum of all the knowledge pertaining to stocks, applied to discounting the future.¹

**Internal forecasting.** Technical or internal analysis is based upon the principle that the market is its own best barometer and that the varying demand and supply of stocks will to a large extent govern the market’s future moves. It requires study of a vast amount of technical data to evaluate the relative strength of the buying and selling pressures which cause the fluctuating willingness to buy or willingness to sell of countless numbers of investors and speculators. It is a study of supply and demand, a study of the effects which fundamental changes cause in the price trends of shares.²

The technical approach is based upon factors which relate chiefly, or at least more directly, to the market itself, to the price movement which results from the constant interplay between those who want to buy

¹Drew, loc. cit. ²Tabell, loc. cit.
and who thus advance prices, and those who want to sell and thus depress prices. The technical approach is a scientific effort at judgment and forecast through a studied consideration of such opposing forces which in the final analysis are directly responsible for the rise or fall of security quotations in any open market.

In other words, the fundamental factors suggest what ought to happen in the market, while the technical factors suggest what actually is happening in the market. In his scholarly "An Analysis of Economic Time Series," H. T. Davis arrived at the following conclusion:

It would appear from the analysis of other parts of this volume, that no time series yet discovered precedes the stock market to averages. Thus while industrial production appears to depend upon the movement of the stock market behind which it lags about three or months, the converse does not appear to be true. Hence, with the present data, it would seem that any theory of forecasting market action would necessarily be an internal theory. For the Upon completing his study of the randomness of stock prices, Professor Burrell concluded: "If stock prices are not random it is certainly theoretically possible that internal market analysis may provide a reasonable basis for stock price forecasting."

As the stock market has grown in complexity, as the number of participants has increased through the years, and as the stock market fits into a generally more complicated economic whole, there has developed at times a stock market cycle which is independent of the business cycle.

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1. Davis, op. cit., p. 538.  
On some important occasions the market had fairly sustained moves which no study of business conditions or values can illuminate.

For periods shorter than those of the cyclical swings, the value of the service that can be rendered by internal analysis is even greater than its use over the longer periods of time. Frequently, such shorter movements have no counterpart in the state of or outlook for business. Often their cause lies in changes in the psychological attitude of investors. When psychological influences dominate the market, economists and security analysts can provide little guidance. But a study of structural changes in the internal relation of the market can detect the probability of impending trend changes. For once it is known how to isolate the elements out of which the trends are built, analysts are no longer helpless in determining the timing of their reversals. And while catching short-term fluctuations in stock prices does not have, for the investor, the same vital interest as their cyclical turns, it should not be entirely ignored. The selection of an appropriate moment for the execution to buy or sell can mean large differences in the return.

Observation of individual stock movements shows that many stocks are in a dormant state so far as market fluctuations are concerned. They may move a fraction every day but display only one or two spectacular movements every year. Such a movement may be over within a week or two. If it pays the long-pull investor to keep his money tied up in such a stock for a whole year just to get the advantage of that
two-week movement, how much more would it profit the trader who could perhaps tell from his market studies just when in the year that move would come. He could get as much profit in two weeks as the investor received in a year and if he could find other favorable movements to keep his capital working twelve months of the year in this revolving system, it is apparent that he would realize about twenty-five times as much profit in the twenty-five stocks whose short-swing movements he caught as would the investor who is in only one stock.

Internal analysis is of more value to the stock trader because the material used is current, whereas earnings and business data usually lag, sometimes seriously. All too often, adverse or favorable fundamental data reach the average participant in the market only after they have passed through so many hands that could take action that they have become virtually useless for trading or even investment purposes. This is buying in order to realize his profit. A proper understand of the raw material used in market analysis is more measurable, homogeneous, and precise than much of the data currently relied upon by fundamental analysis. There is considerable arbitrariness, for example, in the important item "earnings" as it appears in the financial statements. Accounting exigencies frequently alter this item from year to year, so that it is not strictly comparable. Several things keep earnings from being strictly comparable. The role of inventory profits varies. Sometimes it is hard for an accountant to distinguish a capital expenditure, which is not deductible from earnings, from a
current expenditure, which is. Some companies set aside reserves equal to their taxes, while others set aside reserves greater than their expenditures and yet do not have general distinct taxes, and some do not set any aside.

In an inflationary period, earnings are likely to be systematically overstated because the depreciation charges are likely to lose step with costs and prices. A competent analyst may be able to make the necessary adjustments, but the item, earnings per se, does not have the homogeneous character of, for example, the closing prices.

The final reason for internal analysis is that the professional stock traders must make their living from the public. If one group of operators makes a living out of trading, then some other group must provide those profits. If the "inside element" buys when everyone else is buying, there will be no one left to sell to later on. The professional, therefore, must buy when the public is selling and sell when the public is buying in order to realize his profit. A proper understanding of this simple piece of logic is at the bottom of trading success and the basis for the equally important consideration that the market does not always do what seems most logical or what the public expects it to do.

Since prices often move counter to fundamental suggestions, then this establishes the basis for advantage in a consideration of technical factors which may suggest the immediate future trend of prices and thus aid in determining when the trend will be with fundamentals and when it will be contrary to them.
III. INTERNAL METHODS FOR DEALING WITH THE MARKET

Methods of dealing with the market fall into several distinct classifications. The term "dealing with" rather than forecasting was used here because very few methods in the implied sense actually attempt to forecast. The term "method" means something which is to be employed to the exclusion of all other considerations and which specifically indicates buying or selling.

Three factors of technical analysis. By following the inertia in stock prices, by testing the buying power and selling pressure in the market, and by measuring the accumulation and distribution of the shares, technical analysis attempts to judge the condition of the market.

A most useful segment of technical analysis is based on the principle of inertia or momentum. Previously it was shown that this was tested by the Cowles Commission and it was disclosed that stock prices had a 0.625 chance of continuing a movement rather than reversing it.\(^1\) Thus a stock trend up or down is more likely to continue than to reverse. This is a well-known principle used by weather forecasters. If today and yesterday have been clear and sunny, the odds favor sunny weather tomorrow also. If the last five per cent move of the market was up, chances are that the next move will be up also. Once a trend starts, the probable thing is for it to continue though

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\(^1\)Cowles, "Stock Market Forecasting," p. 213.
no one can say for sure how long or how far. Whether the trend be up or down, however, don't fight it, follow it. In the next chapter it will be shown how the earliest technical method, the Dow theory, discovered this principle and made use of it.

As was pointed out earlier, the forces which move the market are innumerable. When they become strong enough to overcome man's resistances, such as inertia, hesitation, fear, and others, they assume two forms. They are either leading individuals to buy securities or they lead individuals to sell securities. The buying forces are called Buying Power. The selling forces are called Selling Pressure.

The market is constantly exposed to the action of the buying power and the selling pressure. For as long as these two forces are identical, the market will remain stationary. When the buying power proves greater than the selling pressure, the market will move upward. On the contrary, when the selling pressure is stronger than the buying power, the market will move downward. The market can only move in two directions outside of standing still: up or down.

Buying power is not identical with demand. Nor is selling pressure identical with supply. Demand and supply entail a connotation of free movements, of spontaneous decisions on the part of the multitudes. Buying power and selling pressure are not free motions. They are not spontaneous. They are generated, engineered, and planned movements on the part of the few. Stocks move because there are a few individuals who come to the conclusion, after study, that a particular stock is
cheap or expensive. They begin buying and selling and use a variety of methods to get the public to buy. The buying is not spontaneous. It is planned and forced and there is even deceit in it. This can cause the sharp fluctuations in stock prices which do not agree with the fundamental conditions. It can cause the bull and bear markets.

By means of various ratios and charts it is possible for internal analysis to measure the buying power and selling pressure at any particular time and use it as a clue to future trends.

The zones of change in the primary or long-term trends are of great speculative value because they represent areas of distribution where stocks are said to be "overbought," or areas of accumulation where stocks are said to be "oversold."

When the primary trend breaks and the market enters a reactionary technical analysis of stock trends, at any time the market is and corrective direction, the zone around which the changes took place subject to four movements of trend: 1) the long-term growth of the is an area of distribution. It is said then that a stock enters into nation or secular trend. 2) the major trend, 3) the intermediate an area of distribution when, after having climbed for a certain period trend, and (4) the minor trend or daily fluctuations. After of time, the buying power loses its leadership to the selling pressure;

The long-term trend may take a period ranging from a few months and prices, after a period of hesitation which may last from a few days fluctuates. If the same buying or selling pressure reasserts itself to a few weeks, begins to descend. The decline may be orderly or it may be nervous, precipitate and chaotic.

On the other side, a stock may enter into a period of accumula-

selling pressure and a "bottom" is left behind by prices which are
confidently marching toward higher sectors.

The proper identification of zones of accumulation and distribution is, therefore, of the utmost importance to the speculator. This, then, is another area where internal analysis is invaluable to the speculator.

Throughout the years various types of charts have been developed and kept of individual stocks, groups of stocks, and of the entire market as indicated by one of the representative stock averages. Records are kept of the prices and in some cases of the number of shares traded. Particular types of patterns seem to recur which, according to the developers of these charts, indicate areas of accumulation and distribution. These are to be covered, in detail, in Chapter V.

Technical analysis of stock trends. At any time the market is subject to four movements or trends: (1) the long-term growth of the nation or secular trend, (2) the major trend, (3) the intermediate trends, and (4) the minor trend or daily fluctuations.

The long-term or secular trend has been moving slowly up since colonial days. This coincides with the industrial growth of our country.

The major trend usually lasts two or three years for advances and approximately fifteen to eighteen months for declines. Quite often an intermediate trend. The major trend is composed of a series of each major move has five stages, three in the direction of the main trend and two corrective reactions move in the opposite direction.

Even if it would be possible to forecast accurately for the most of these.

Tabell, op. cit., p. 55.
The intermediate trend is superimposed on the major trend. It usually lasts from two to six months and accounts for an advance or decline of about ten per cent in the stock averages. If the major trend is up, an upward move in the intermediate trend is usually followed by a corrective reaction that retraces about one-third to two-thirds of the previous advance before the uptrend is resumed. While a major bull market may advance the major trend one hundred points, the intermediate trend may travel two hundred fifty points.

The minor trends or daily fluctuations are superimposed on the intermediate trend. They last from one day to two weeks and result in price changes of five per cent or less. They are caused by the market becoming temporarily "overbought" or "oversold" or by a quick interpretation of new events.

The buying power and selling pressure are the forces which cause the trends in the stock market. Internal analysis has developed two methods for dealing with the trends. One set of procedures was designed to recognize the trend at an early stage and enable a trader to follow it. The other set of methods seeks to anticipate the trend and enable a trader to take a market position before the trend is established.

Of greatest significance to the trader is the study of the major and intermediate trends. The daily fluctuations are in most cases impossible to predict. So far no method has been developed and made known that can predict with any degree of accuracy these minor swings. Even if it would be possible to forecast seventy-five per cent of these,
the cost of commissions and taxes would undoubtedly result in a loss of capital. The secular trend is of little interest to the trader because it would require an average lifetime to increase an investment perceptibly if secured at the wrong time. Institutional investors with their formula plans and dollar averaging methods can capitalize on this trend. Thus the most promising areas, for the trader, are in the major and intermediate trends and it is these that have received the greatest amount of study in attempting to forecast the market. The methods of trend identification endeavor to determine the direction in which the security prices are heading, but they do not pretend to show the duration or the amplitude of the movements. They attempt to indicate as promptly as possible after the event when investor "mob psychology" has shifted and the trend has changed. The Dow theory is the most popular method of this type. Most of the other techniques in this classification either are modifications of the orthodox Dow theory or use moving averages or combinations of the two. Identification of the major trend is very important; however, the most significant thing to know is the direction of the major trend. This is the result of the conflicting downward and upward pressures exerted by the many different forces. It is a broad movement almost is usually wrong. It employs the "Theory of Contrary Opinion" and various

\[1\text{Ibid.} \]
glacier-like in its imperturbability and slowness. Intermediate fluctuations, lasting for several weeks or months, obscure it and the minor fluctuations of several days' duration frequently confuse it. But over longer spans of time there is a discernible trend within which these intermediate and minor movements merely contribute internal oscillations.

The Dow theorists profess only to characterize pre-existing movements. Other technicians have gone a step further. They have developed methods intended to identify imminent changes in established trends. These techniques are chiefly based on the theory that the relative strength of buyers and sellers govern the direction of stock market movements. According to this theory, if analysis of falling prices indicates that buyers are becoming more aggressive, an upturn is likely to develop. Conversely, it is reasoned, gathering selling power will eventually reverse an upward trend of market values. To reveal these conditions, various comparisons are made of statistical series designed to measure the buying and selling power underlying market fluctuations: (1) the relationship between speculative and conservative stocks; (2) a comparison of price and volume data; when volume drops while prices rise a reversal movement is supposed to be forming; and (3) comparison of market trends and the character of the buyer and seller. It is based on the assumption that the small trader is usually wrong. It employs the "Theory of Contrary Opinion" and various ratios from the odd lot sales and short sales are used in
making its indications about the future trends.

The highest-grade stock will produce a loss if it is purchased at a major top, which is the point at which the major trend turns down. The lowest-grade stock if bought at a major market bottom will produce a profit. Security selection will improve results within the framework of the major trend, but it always must be remembered that most individual security price movements are more closely correlated with the major trend than with the trend of their own earnings, dividends, and so forth.

The most important thing to know about the stock market is when it is forming a major top, for the ensuing decline may wipe out years of profit and income, years of successful choices and operations. The first clues of an impending major market top usually appear in technical measurements. It was stated previously that many economic series have been examined and none of them were found to move regularly in advance of a stock market decline. The major trend is made up of so many variables, money supply, sales, commodities, inventories, credit, production, and so forth, and these varying elements combine in such a wide variety of ways, that no two major market tops have ever been the same. There is no one cause for a decline. Different periods and different economic and financial constellations make varying series dominant at different times.

Joseph Mindell, an economist and a partner of a Member Firm of the New York Stock Exchange, is a staunch supporter of scientific
analysis of stock prices. In his carefully prepared work he lists a
number of technical indications which can be used to detect a major
top and he indicates that the appearance of a majority of these con-
stitutes a grave warning signal. They are summarized as follows:

1. A mature rise has already occurred. There must be a worth-
while rise to be reversed.

2. A period of high public participation in the market has occurred in the recent past. The "Uninformed Buyer" has been optimistic and carefree. This is revealed by the high relative volume and the poor quality stocks which are active.

3. The market has breadth on the continuation of an upswing. It is dangerous if the number of issues traded decreases as the market rises, if the number of advances diminishes and the number of declines increases. These reveal that the market as a whole is sparked by less general buying. The leaders are carrying the ball rather than the market as a whole.

4. The market rises for an upswing on less volume than during the preceding upswing. Less money is entering the market on the rise.

5. The relative volume in the investment issues declines. The institutional buyer is becoming less aggressive on the upside.

6. Isolated breakdowns occur in individual issues during the general market strength, suddenly some important stock collapses and stocks fail to recover from this severe decline.

7. The marginal stocks lose pace in relation to the high-grade
leaders. Informed speculation is becoming less aggressive.

8. The early market leaders of the advance are unable to retain their gains while other leaders are brought forward. The ratio lines give valuable clues here. Rotation of different groups and stocks appears, and the rotation descends in quality.

9. There is a recent period of churning in the market. This is indicated by a high volume of sales relative to the advance achieved.

10. There is increased selectivity as the market advances.

11. Divergencies appear among the different groups.

12. Long-dormant issues become active. Unfortunately there have been many because the stock prices fell. Capital goods stocks strengthen in relation to consumers goods stocks. Real analysis gives a number of indications of a major bottom.

13. Traditional tail-enders come to life. More sensitive measurements of buying pressure lag as the market rises to new highs. Meanwhile selling pressure has been rising for awhile. A sizeable decline has occurred from a major top.

14. The 1929, 1937, 1940, and 1946 tops occurred as boomlets after earlier weakness made many observers expect declines from a lower level at an earlier date. The boomlets frequently re-attract these observers before the real decline sets in.¹

After a major top is reached, the major trend turns down. Frequently, the decline is interrupted by sharp reversals, which tend

¹Mindell, op. cit., pp. 250-252.
to build up speculators' hopes, only to turn again and continue the downward plunge. Just such a situation was described by J. K. Galbraith in his study of the stock market crash of 1929. He described how a number of smart traders had sold out before the crash and had been able to avoid the panic and resulting gloom. After the initial sharp plunges many were lured back into the market, as it started to climb, thinking that the bottom had been reached; only to have it drop down a great deal further.  

It is apparent that the best place in which to concentrate general buying of securities is during a major bottom. Unfortunately there is no one clear invariable signal of a bottom because the stock prices usually turn up before business improves.

Technical analysis gives a number of indications of a major bottom. Mindell has gathered some of the more important ones and they are summarized:

1. A sizeable decline has occurred from a major top.
2. Many stocks are selling below their net current asset values.
3. There is a low volume of trading.
4. The volume of activity in investment issues increases as the institutional buyers come in.
5. The volume and breadth of the market diminish on successive drops. The market is thinning out and is becoming more selective.

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on the decline.

6. The market becomes increasingly invulnerable to bad news.

7. Ratio lines give clues that some important stocks are begin-

ning to show resistance while the rest of the market is weak, and strength

while the rest of the market is dull.

8. The steels weaken more than the general market.

9. The "blue chip" stocks collapse in a final desperate abandon-

tment of hope. While the majority of stocks are falling off a peak

data, a few are making new high or recording new

10. Divergencies increase among different groups.

11. Sensitive measurements of buying pressure stabilize and

start to rise while selling pressure ebbs.

12. High-grade bonds start to rise.\(^1\)

In conclusion, if an investor is to maximize his profits, it is

essential that both the major top and the major bottom be recognized as

soon after the turning point as possible. The top must be recognized

prices of individual groups versus the composite or other averages.

In conclusion, if an investor is to maximize his profits, it is

prices of individual groups versus the composite or other averages.

analysis seeks to examine the previous major tops and bottoms to see if there are any similar features. Then these similarities are used to assist in identifying future turning points of the trend.

Areas of progress. There have been a variety of methods developed by the internal analysts with which to study the market. Many met with very limited success. However, through trial and error, combined with intensive study, four divisions of stock market analysis have evolved which seem likely fields for serious efforts. They are: price ratio data, volume ratio data, breadth of the market data, and trading ratio data.¹

Price ratio data includes the following subgroups: (1) The variations of individual stock prices versus the composite or other averages of prices of individual stocks. The changes in the relative trends, as expressed by ratios of both volume and price, provide reliable evidence of trend reversals. (2) Prices of minor groups such as the steels, oils, chemicals, and so forth, versus the general market average. (3) Low-priced aggregates versus the high-priced aggregates. These ratios can be interpreted to understand the internal structure of the market, which is constantly reflecting the impact of the psychological as well as the fundamental forces.

(4) Relative velocity ratings. The relative gain of the individual stocks compared to the gain of the general market is computed, with these averages for five years or more, with separate average ratios computed for both advances and declines.

Volume ratio data would include: (1) volume for an individual stock versus its group, a sample average, or the market as a whole. This indicates turnover. (2) Volume of low-priced marginal or "hope" shares versus the volume of high-priced shares. This presumably shows speculative versus investment activity.

Breadth of the market data include daily advances, declines, and total issues traded. A seven-day moving average of the ratios of the advances and of declines to the issues traded shows conditions of over-optimism or over-pessimism.

Trading ratio data include the shares traded, number of transactions, both divided into long and short position for both round-lot and odd-lot transactions.

This is a basic outline of the present-day approaches and in the next two chapters they will be explained further.

III. SUMMARY

There are two major approaches to the problem of forecasting the stock market: external forecasting and internal forecasting. External forecasting depends upon general business conditions and events outside of the stock market to foretell its future movements. Even
though the stock prices will reflect business conditions, it was estab-
lished that they turn ahead of most business indicators. Therefore
market students turned to a study of the stock prices, themselves, and
the number of shares traded to see if they would provide better clues
to future movements of prices. Thus, internal analysis was developed.

Internal analysis, itself, has two major divisions; one seeking
merely to identify the trend of the market, at an early stage, and
follow it until after it turns, while the other actually seeks to antici-
pate the change in the trend before it occurs.

It came to be recognized quite early that the market, as well as
individual stocks, tended to move in trends. Later this was verified
by the studies of the Cowles Commission. They found that stock prices
contained inertia which caused them to have a tendency to move in the
same direction rather than to reverse. A number of procedures make
use of this inertia to follow the market's trend.

The other group, which seeks to anticipate the turning point of
the trend, studies the buying power and selling pressure, in the market,
and they attempt to locate price ranges which are said to be areas of
accumulation and distribution of stocks. They believe that this will
provide clues to the future prices of stocks. In addition a great
deal of effort has been devoted to the study of previous major turning
points of the market to see if they would provide clues to future changes.

It is believed that progress is being made, in some areas of
internal analysis, toward forecasting stock prices. The next two chap-
ters will cover these areas in detail.
CHAPTER IV

INTERNAL METHODS FOR DEALING WITH THE ENTIRE MARKET

In the previous section it was described in some detail how the field of internal analysis has two principal groups of methods for dealing with the stock market. One group seeks to identify the trend at an early stage and to follow it until it turns, while the other group seeks to anticipate the trend and to enable the trader to take his market position before the trend starts.

Actually there is not the clear-cut division between the two groups as described there. Rather there is a gradual shading together of the methods and there are some that attempt to combine forecasting systems for following the stock market. As such efforts are frequently combined with trend following.

Inasmuch as economic forecasting is not an exact science, like mathematics or physics, it should not be expected that its methods and tools fit into neatly cataloged and sharply delineated divisions.

With this thought in mind the analysis will proceed to those methods which, in general, attempt to follow the trend.

I. METHODS WHICH ATTEMPT TO FOLLOW THE TREND

Even before the Cowles Commission established that stock prices contained inertia, which would result in trends, many investors and traders were aware of the fact. Through the years an enormous variety of ratios, averages, charts, graphs, signs, and signals were devised speculators who were interested in such matters.
and employed to take advantage of this. A few seemed to work for a while but most of them did not. From this agglomeration some seemed to show, perhaps to a limited degree, promise. For purposes of analysis they have been separated into four main groups: the Dow theory, mechanisms of the Dow theory, moving averages, and miscellaneous trend methods.

The Dow Theory

The Dow theory is a method which seeks to follow the market trend by studying and interpreting the action of the Dow Jones industrial averages and the Dow Jones rail averages. The theory has considerable following and is, without question, the best known of all market's success is due to the fact that it has broken through the limitations of single stock systems for following the stock market. It has been extensively defended and as widely criticized. It is not a system for "beating the market" and was not so considered by the formulators of the theory.

What has come to be spoken of as the Dow theory is in effect a combination or synthesis of two ideas: the combined market wisdom of Charles H. Dow and William Peter Hamilton, who were both editors of the Wall Street Journal.

Dow presented a radically novel idea, when he showed that beneath the fluctuations in individual stocks there was present at all times a trend of the market as a whole. Until that time people who thought about such matters at all generally assumed that fluctuations in the prices of stock were individual and unrelated, dependent entirely on the circumstances of the particular company and the current attitude of those speculators who chose to trade in each particular stock.
The Dow theory is based on interpretations of the price patterns formed by two groups of stocks, the thirty stocks of various industrial companies which make up the Dow Jones industrial average and the twenty railroad stocks which compromise the Dow Jones railroad average.

The Dow Jones Company originated the idea of stock price averages; its first list was published in 1884 and consisted of eleven stocks. Various changes and modifications have been made from time to time bringing the industrials up to a total of thirty and the rails to twenty. Many of these changes were made to improve the results of the averages; various others have been constructed to better indicate the market's movements, yet the Dow Jones averages remain the best known.

Basic features. Dow theorists believe:

1. High points and low points of price fluctuations terminate above the preceding movement.

2. The fluctuations of the daily closing prices of the Dow Jones railroad and industrial averages afford a composite index of all the financial movements, and knowledge of everyone who knows anything about financial matters, and for that reason the effects of coming events (excluding acts of God) are always properly discounted in their movement. The averages quickly appraise such calamities as fires and earthquakes.\(^1\)

3. The average is always changing, and if it is not changing, then there is something wrong.\(^2\)

The Dow theory must be understood as a history of events rather than the events themselves.\(^3\)

Everything that everybody knows about anything with remote bearing on finance finds its way into Wall Street, in the form of information; the stock market itself, in its fluctuations represents the sifted value of all this knowledge.\(^2\)


\(^{2}\) Ibid., p. 78.

\(^{3}\) Ibid., p. 21, citing William F. Hamilton, editorial in the Wall Street Journal, May 29, 1929.
Beginning with this premise that the market itself knows everything that there is to know and that it reflects this information through the action of its averages, Dow conceived of the stock market as having movements very much in the way that the tides of the ocean ebb and flow. The primary movement was the tide; the secondary movements were the waves; and the daily movements were the ripples.

Hamilton in his editorials at no time stated his belief in any regular stock cycle. Its duration he felt to be ins calculable. The Dow theory is based on the assumption that the cycle will be irregular; its only objective is to tell when either a bull market or a bear market has terminated; it does not predict how long that market will last.

Thus an upward trend, or primary movement, will continue as long as successive rallies, or secondary movements, penetrate preceding high points and the ensuing declines terminate above the preceding low points. Conversely, failure of the rallies to penetrate previous high points, with the ensuing declines carrying below the former low points is bearish and indicative of a turn in the primary movement.

Followers of the Dow theory believe that any change of direction must be confirmed by both the industrial and rail averages, but the confirmation need not occur on the same day.\(^1\)

The Dow theory does not give indications every day and all the time; an indication remains in force until it is cancelled by another,

\(^1\)Ibid., p. 75.
or re-inforced in some way, as, for instance, when the industrial average confirms the railroad average or vice versa.

According to Robert Rhea, the leading practitioner of the theory after Dow and Hamilton, "Occasional exceptions can be found, and it is proper that this should be true, for otherwise these rules would constitute a sure way of beating the stock market. Such a method would, of course, very quickly result in there being no market."¹

Occasionally a situation occurs in the averages which is referred to as "making a line." A "line" is a price movement extending two to three weeks or longer, during which period the price variation of both averages move within a range of approximately five per cent. Such a movement is supposed to indicate either accumulation or distribution. Simultaneous advances above the limits of the "line" indicate accumulation and predict higher prices; conversely, simultaneous declines below the "line" imply distribution and lower prices are supposed to follow. Conclusions drawn from the movement of one average, not confirmed by the other, generally prove to be incorrect.

This has come to be one of the major concepts of the theory.

Rhea has said:

The portion of the Dow theory which pertains to "lines" has proved to be so dependable as almost to deserve the designation of axiom instead of theorem. However, "lines" do not occur frequently enough to satisfy most traders, with the result that many endeavor to see "lines" that do not exist.²

¹Ibid., p. 78. ²Ibid., p. 79.
The essential features of the Dow theory, as first presented by Dow and Hamilton, have been well summarized by Professor Leffler:

1. There are three movements in the stock market; (1) the primary movement, (2) the secondary reaction, and (3) the daily fluctuation of stock prices.

2. Primary and secondary movements may be forecast by the action of the Dow Jones rail and industrial averages.

3. The averages do not forecast how long a primary or secondary movement will last, but their action does indicate when a new movement has begun.

4. Confirmation of a new primary or secondary movement is indicated either (a) by both averages making a line and then breaking out of the line; or (b) by both averages making new highs or new lows. Both averages must confirm each other.

5. The market is forecast by movements of the averages, which discount everything; there is no need to consider volume, to introduce other economic series, or to use extensive charts and records. A study of formations such as double tops or double bottoms, is not essential or greatly helpful.

6. The primary purpose of the theory is to forecast the major trend—the bull or bear market; it may forecast secondary movements, but this is of little significance.

7. The primary trend will continue as long as the averages confirm each other.

8. The theory is not a system for "beating the market," but rather one that can benefit the intelligent speculator who wishes to protect himself by a study of the averages as a stock market barometer.¹

Both Dow and Hamilton believed that the theory needed only the two stock averages to operate. No other averages were necessary; no

other economic series was essential. In fact, both men repeatedly stated that to use any other series was not only meaningless and a waste of time, but absolutely harmful.

Many critics of the theory today, as will be observed later, believe that a series other than the two averages would be more logical. This premise was early rejected by Dow and his disciple. Said Hamilton:

The weakness of every method is that extraneous matters are taken in from their tempting relevance. There have been unnecessary attempts to combine the volume of sales and to record the averages with reference to commodity index numbers. But it must be obvious that the averages have already taken these things into account, just as a barometer considers everything which affects the weather. The price movement represents the aggregate knowledge of Wall Street, and above all its aggregate knowledge of coming events... The market represents everything everybody knows, hopes, believes, anticipates, with all that knowledge sifted down to what Senator Dolliver once called, in quoting a Wall Street Journal editorial in the United States Senate, the bloodless verdict of the market place.1

Dow wrote, as already indicated, in 1900 to 1902. At that time, and the reasoning is not very novel, his theory would have taken his first average, largely a rail one, had been compiled for sixteen years, but his industrial average had been in existence only three years. On this evidence, however, he made certain observations. It was his belief that one could not forecast the length of a major bull or bear market. Said he: "It is impossible to tell in advance the length of any primary movement."2 This basic premise of the Dow theory

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is still unchallenged. No one can forecast the length of a primary movement, and no follower of the Dow theory believes that the theory can so prognosticate.

Results of the Dow theory. In the following illustrations an attempt was made to evaluate the Dow theory in the light of its ability to indicate the end of a bull or bear market.

The theory was probably put to its greatest test in the crash of 1929. On September 3, of that year, the rail average reached its peak for the year of 189, the industrial average reached its peak of 381. Both averages began to decline and sharp breaks occurred on October 23 and 24. On October 25, the Wall Street Journal carried a Hamilton editorial entitled "A Turn in the Tide." In it he said that the averages of October 23 signaled the end of the six-year bull market and the beginning of the bear market. The theory would have taken a trader out of the market after a 12 per cent decline in the rails and a 22 per cent decline in the industrials.

TABLE I

<table>
<thead>
<tr>
<th>Date</th>
<th>D.J. Rail Av.</th>
<th>D.J. Ind. Av.</th>
</tr>
</thead>
<tbody>
<tr>
<td>9-23-29 close</td>
<td>189</td>
<td>361</td>
</tr>
<tr>
<td>10-23-29 close</td>
<td>167</td>
<td>306</td>
</tr>
<tr>
<td>7-8-32</td>
<td>15</td>
<td>31</td>
</tr>
</tbody>
</table>

The market enjoyed a nice climb in the period from 1942-46. The industrial average reached its peak on May 29, 1948, and the rails on June 13. On August 28, according to Leffler, a leading Dow Service announced that the bull market was over.\(^1\) By that time the industrial averages had declined 23 points and the rails 10. The selling signal would have taken the trader out of the market after a 46 per cent loss in the industrials and a 44 per cent loss in the rails for the year.

On May 14, 1948, both averages confirmed the existence of a bull market. It was strong for two days, then the market leveled off and fell sharply on July 17. This was a false signal. The market went up 5 points after the signal and had already gone up 23 points as measured by the industrial average. From February to May, 84 per cent of the rise took place before the signal.

In the period from 1938-48 the theory was perverse. If an individual invested $10,000 in 1938, in stock of the industrial average, and had followed the Dow signals, it would have grown to $11,903 by 1948. If the investor had bought the same amount of stock and simply held it, it would have been worth $13,653. Also he would not have had any commissions, other than the first one, to pay and he would have received more in dividends.\(^2\)

The bull market of 1949-59 is the longest on record and it began

\(^1\)Ibid., p. 548.\(^2\)A. W. Jones, "Fashions in Forecasting," Fortune, L (March, 1949), 91.
on June 14, 1949. At that time the industrial average gave a signal on August 5 and the rails on December 2. The industrial average had climbed 21 per cent by then.

In 1953 the industrial average showed a bear market signal in January and the rails on August 21. During the next two weeks both averages fell about 5 points. The industrial averages reversed their trend and began to rise. It was not confirmed by the rails until May 7, 1954. By that time the industrials had gone from 255 to 321, a 28 per cent gain to the peak of 437, reached on September 24, 1955, just before the President's heart attack.

Figure 1 on the following page shows the action of the Dow Jones industrial and rail averages for late 1959 and early 1960.

On July 8 the rail averages reached a peak of 173 and on August 3 the industrials reached their peak of 678, at point "a." From there an intermediate decline started, reaching a low in the industrials on September 22, at point "c," and in the rails on November 17, at point "e." After reaching the low at "c," the industrials climbed until, at "b," the previous high point of "a" was exceeded. This indicated a continuation of the bull market. However the rise of the industrials was not confirmed by the rails which failed to exceed their previous high of 173. Within a few days the industrials began a rapid drop, until at "d," they exceeded the September 22 low point and thus gave a bear market signal. This was confirmed by the rails on March 3 when they penetrated their November 17 low. Thus, according to the Dow theory, a bear market was in progress.
By the time of the first signal some observers foresaw that there would be a break from 600 to 612, but it will be borne out that this was not realized.

In general the Dow theory has worked badly in recent days, at least since the end of World War II it has given unreliable signals. The market has taken the opposite course.

A study of the Dow theory by A. L. Davis, who was one of the more favorable students of the theory, revealed that the typical rise of a rallies has been followed by a fall in the bull market confirmations of the Dow theory.

Typical period from 1897 to 1947 an examination of the "bull market confirmations of the Dow theory" revealed that the typical rise of the rallies has been followed by a fall in the bull market confirmations of the Dow theory.

Figure 1. Dow theory. Bear signal at "d" for industrials, confirmed by rails at "f," which occurred in early 1960. (Data from The Wall Street Journal)
By the time of the bear market confirmation the industrials had dropped from 685 to 612. It remains to be seen how extensive the decline will be.

In general the Dow theory has worked badly since 1938. At least three times since the end of World War II it has given definite signals and then the market has taken the opposite course.

In a study of the bull market confirmations of the Dow theory over the fifty-year period from 1897 to 1946 an examination of the thirteen bull markets disclosed that the typical rise after confirmation was 44 per cent with a market increase after each confirmation.\(^1\) This was one of the more favorable studies of the theory.

**Conclusion.** A study of the Dow theory by H. T. Davis, who was referred to earlier in connection with the inertia in stock prices, resulted in the following conclusion:

Fundamentally the first postulate of the Dow theory appears to be sound, namely that if the stock market can be forecasted, then the averages must forecast their own future.\(^2\)

The second postulate of the Dow theory appears to be that when a movement of the market has been for a given time in one direction, the probability is greater than one-half that the next move will also be in this direction. That is to say, there is a kind of inertia which tends to make the averages move for a time in one direction or another.

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\(^2\) Davis, *op. cit.*, p. 538.
The second postulate is a very important one and must be carefully understood and statistically defined. For this purpose one might compare with the time series of the stock averages a second series constructed by the accumulation of random tosses of a coin. . . . From this we may conclude that the sequences and reversals which are noted in the rail stock series are not of the same statistical character as that observed in the synthetic series; that is to say, if a trend has once been established in the rail stock series, the probability is greater than one-half that it will continue. Such success as the Dow theory has had in forecasting is due, in the writer's opinion, to this significant fact.1

Defenders of the theory can gather facts to show that it works. It does not get the trader in the market at the bottom or out of the market at the top; but one should not expect perfection in a trading method. It does forecast the turn of the market before it has gone too far and it permits the trader to make a reasonable profit before termination of the trend.

There are a great many criticisms of the Dow theory and Joseph Mindell has well summarized the more important ones:

1. . . . in the light of current techniques and knowledge it is crude and over-simplified—like a primitive astronomical theory.

2. The Dow averages can only give measurements of price changes, only a picture of surface conditions. They give no data on the more vital matter—the condition beneath the surface, the internal balance which reveals the vulnerability or invulnerability of the stock market.

3. The major weakness of the Dow theory lies in the vagueness of its central concepts. It states no clear and precise definitions of major, secondary, and minor trends. We cannot tell what the duration and extent of these moves should be, nor how we can define the secondary movements so that all followers of the theory can be in agreement at any one time.

1Ibid., p. 541.
4. The Dow theory disregard of the qualitative approach to the market is a great scientific weakness... The condition of the market, as a gradually evolving characterization, is more important than new highs or new lows in the averages and their confirmation.

5. ... the theory is late in giving its signals.

6. A temporary news burst may carry the Dow-Jones averages to new highs although the major trend is really reversing. We must observe the character of the preceding stock market action. This is more important than the mere fact of new high or lows.

7. The notion of confirmation of one average by something else is excellent... However, it is questionable whether the Rail stock average is the best series for this purpose. When Dow formulated his theory, virtually every movement of goods, whether raw materials or finished products, went by rail... Hasn't increased transportation by other means (trucks, pipelines, cargo planes, etc.) altered the value of such confirmation?

8. Also, the theory doesn't state how long it is necessary to wait for confirmation: one day, two weeks, six months.

9. The concept of the line is the least useful part of the Dow theory. The line may really represent an even balance of buying and selling rather than accumulation or distribution. Lines are very untrustworthy. A high percentage of false signals occurs out of them.\(^1\)

Leffler maintains that its successes are overrated, it is not precise, it fails to forecast tops and bottoms, confirmation is uncertain, it is too slow, one cannot buy averages, and it is based on an early economy in that the control of trading by the Government and the Federal Reserve has changed our economic system.\(^2\)

In his analysis of the theory, Benjamin Graham of Columbia University said:

\(^1\)Mindell, op. cit., pp. 217-221. \(^2\)Leffler, op. cit., pp. 550-553.
In our view, based on much study of this problem, the recent change in Dow Theory results is not accidental. It demonstrates an inherent characteristic of forecasting and trading formulas in the fields of business and finance. Those formulas which gain adherents and importance do so because they have worked well over a period, or sometimes merely because they have been plausibly adapted to the statistical record of the past. But as their acceptance increases their reliability tends to diminish. This happens for two reasons: First the passage of time brings new conditions which the old formula no longer fits. Second, in stock market affairs the popularity of a trading theory has itself an influence on the market's behavior which detracts in the long run from its profit-making possibilities. (The popularity of the Dow Theory may seem to create its own vindication, since it would make the market advance or decline by the very action of its followers when a buying or selling signal is given. A "stampede" of this kind is, of course, much more of a danger than an advantage to the public trader.)

The Dow theory was a great pioneering contribution. It indicated the value of internal stock market evidence and the possibility of grounding market analysis upon objective factors rather than upon news, general opinions, or laggard statistical data. The great popularity of the Dow theory in financial circles reveals the pathetic human hunger for a mechanical gadget that will do our thinking and make our judgements for us.

Although it doesn't chart the course of the market effectively, it has charted valuable pathways for inquiry and research.

Mechanization of the Dow Theory

Moment's theory. Samuel Moment tested the Dow theory over a long period by application of definite rules so as to eliminate any

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possible controversial indication. His major trend rules were simple. Buy when the last secondary rally on both averages is exceeded and sell when the last secondary decline is exceeded, either of which establishes a new major trend. To be exceeded, a high or low point must be penetrated by 1 point if either average is under 100, 1 per cent if between 100 and 150, 1 1/2 per cent between 151 and 200, and 2 per cent above 200. A secondary movement is one retracing one-third or more (regardless of time) of the last price swing in the direction of whatever major trend has been previously established. If any secondary movement fails to make the required degree of penetration, the point of failure becomes the level which must subsequently be exceeded (by the necessary percentage) to establish the new trend.

A study over the period from 1897 to September, 1932 showed a fund of $100,000 would increase to $2,937,300, without allowing for capital gains tax, using stocks in the Dow-Jones Industrial average and by taking short positions when sales were made. Allowance was made for commissions and transfer taxes but not for dividends or stock rights. This study also proved that confirmation of one average by the other was not necessary. When applied to the industrial average alone, the fund would grow to $3,679,800 in the same period.1

Moving Averages

methods must be selected and followed with care. In order to study market trends various methods have been used of the most important groups of statistical analysis in market trends are the moving averages. They are employed.

developed. What they do is to set up some criteria for defining the trend at any given time. If these criteria indicate that the trend is up, one buys on the assumption that the trend will continue. If the trend is down, a short position is taken. Such methods are an assurance of being on the right side of the market when important moves come along. If the trend doesn't continue but quickly reverses itself, it usually means taking a loss. The net result is, ordinarily, many small losses and a few large profits.

The time at which the method is adopted can make a difference. If an important move occurs at the beginning the capital will be immediately increased and a few small losses won't hurt. But if the initial period is dull with only small fluctuations 25 to 30 per cent of the original capital can be lost before a profit results.

No forecasting is involved. When a signal is given there is no way of knowing from the method whether it will mean a large profit or a little loss, because all that it says is that a trend has been established with no guarantee that it will continue. Therefore these methods must be followed with one hundred per cent consistency on every signal given. To interpose judgement on the basis of other factors is fatal to ultimate success. Moreover, they must not be combined for a stronger "forecast," because they do not forecast. One particular method must be selected and followed implicitly.

One of the most important groups of statistical criteria in analyzing market trends are the moving averages. They are employed to straighten out the sharp up-and-down fluctuations of the market.
General types. There are a number of general types of moving averages used by market technicians. One system is based on a twelve-month moving average of the Dow Jones industrial averages, plotted monthly. A definite change in the trend is required before it appears on such a curve. The trend of the market is assumed to be up when the Dow Jones industrial average is above the twelve-month moving average and the line is moving upward. The trend is assumed to be down when the Dow Jones industrial average is under the twelve-month moving average and the line is moving downward. When the prices and the moving average are both trending sideways, an accumulation area is indicated.

Similarly either a two-hundred-day or a three-hundred-day moving average of some representative stock average could be used to follow this trend.

The purpose in constructing such a nonsensitive curve is to show the underlying ebb and flow of the tides, which are otherwise obscured by wavelike daily and weekly price changes.

In following the intermediate trend, a twenty-eight-day moving average of the Dow Jones industrial average is constructed. Figure 2, on the following page, illustrates the intermediate trend for the summer of 1959. This should be compared with the chart on page 93, of just the closing prices of the Dow Jones industrials, in order to see how the minor fluctuations have been eliminated leaving just the trend.

In following the minor trend, a twenty-one-hour moving average of the Dow Jones industrial average is constructed.
Figure 2. Intermediate Stock Price Trend Revealed by a Twenty-eight-day Moving Average of the Dow Jones Industrials. (Data from The Wall Street Journal) (1959)
To construct a Semaphore, six-week moving averages are first taken of the weekly highs and lows of some representative stock average. When they are plotted together, the result will be a fluctuating band varying in width. For purposes of identification this band is called Line A. This is drawn or projected two weeks ahead of the market. Then a three-week moving average of the weekly highs and lows is plotted but not projected ahead of the market. This band, called Line B, naturally shows sharper fluctuations because of the shorter time element used, i.e., three weeks against six weeks.

As long as Line B is below Line A, the market is regarded as being in a downtrend, but when Line B turns up and starts crossing Line A, the trend is assumed to be changing and one should buy stocks. The opposite is true in choosing the time to sell. Because of the fact that the same ten per cent rule applies here, the trend will continue as long as the prices have actually begun to move in the direction in which it is believed. Studies have shown that such a system would have assumed they will continue. This is designed to take advantage of the secondary market movements which last a few weeks to months, and it has the advantage that on any sustained move in either direction, users will be on the right side of the market at least 75 per cent of the time. 1

Oscillator. Another use of the moving averages is to chart the net change of the moving averages. For example, if the twenty-one-hour

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1. Ibid., pp. 45-46.
moving average advances 23 cents from that of the previous hour's moving average, that advance is plotted as a plus 23. A decline from the previous hour would be plotted as a minus 23. This type of plotting of net changes is known as an Oscillator. Its main use is to determine when the market is overbought or oversold and therefore near a reversal of trend, whether it be minor, intermediate, or major. When one of the oscillators reaches an extreme plus or minus signal and starts to reverse, it is said that it is very often quite accurate in signaling a change in the trend.1

Miscellaneous Trend Methods

The ten per cent rule. Another application of the inertia principle would be to buy, or sell, whenever stock prices for the month had averaged ten per cent higher, or lower, than the preceding month. According to R. D. Merritt, who is the Financial Editor of the United Business Service, "Studies have shown that such a system would have resulted in substantial gains over a long period. It is a fact that if the last 10 per cent move of the market was up, the chances are better than two to one that the next move will be up."2

This statement appears to be stronger than warranted by the facts as revealed by the studies of the Cowles Commission referred to above.

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1Tabell, op. cit., p. 35.

previously. They said that the chances were .625 that a move would continue.

The major defect of all trends is the danger of being whipsawed by meaningless and temporary reversals which do not change the main trend.

The eleven per cent rule. For a "buy signal" total all of the Friday, or the last day in the week that the market is open, closing prices of the Dow Jones industrial averages for a calendar month and divide by the number of Fridays used. Add eleven per cent of this monthly average figure, plus fifty cents, to the average itself. On any subsequent Friday that the industrial average closes above this result, the market should be bought. In selling the highest single Friday close is used. Deduct eleven per cent from it, plus fifty cents, and then sell whenever on any Friday the average closes below the resultant figure.

The reason for using eleven per cent plus fifty cents was not explained. Undoubtedly, though, it was an attempted mathematical refinement of the ten per cent rule, which was not entirely satisfactory.

The eleven per cent method was described by Drew, and he said:

Applying this rule to the Dow Jones industrial average on the long side only, for fifty years from 1896; a $100,000 would have increased to $1,548,600 in 1946 after the liquidation "called for in that year. This calculation does not allow for the dividends received on if it is "sickly" and "weak" and ready for a fall. Being

received nor for taxes on capital gains; nonexistent before 1913, and subsequently variable at different times with individuals.\footnote{Drew, op. cit., p. 32.}

These seem to be the principal groups of methods which attempt to identify the market's trend at an early stage and then to follow it. One might say that all the technical methods are with respect to the market and its internal condition in the same way, one and the same.\footnote{Drew, op. cit., p. 32.}

II. METHODS WHICH ATTEMPT TO ANTICIPATE THE TREND

Often called "character of the market" methods are those which attempt to detect elements of latent strength or weakness in the price structure, thus determining the turning points before a trend is established. According to the practitioners, the turning points are those at which decision is made to forecast, and they are so difficult that they have received little recognition from the general public.

There exists a large middle ground consisting of methods which actually follow the trend, yet they use as indicators data which, according to the practitioners, move ahead of the stock prices. Items such as volume, ratios of low-priced stocks versus high-priced, and so forth.

Other methods are employed to take the "pulse" and "temperature" of the market, to determine if the market is in a "strong" and "healthy" condition or if it is "sickly" and "weak" and ready for a fall. Among the factors of importance is the quality of people to take risks. In confidence times, there...
the tools used are ratios of new highs and new lows to number of issues traded, and the ratios of advances and declines to the total issues traded. It is believed that these will indicate the general "health" of the market, what its internal condition is. From this, one can make estimates about a trend continuing or the likelihood of its turning, based on historical comparison. The whole procedure would rest on safe ground if it were reasonably certain that (1) the factors behind the various indexes used have the supposed significance, and that (2) all essential market influences are properly taken into account in those indexes. A powerful financial group may have decided to enter the market when the Dow Jones industrials reach a certain level. If this decision is kept secret, the movement of the market can't be affected by the impending transaction. And no market analysis can anticipate the rise or the fall in stock prices which will occur if the averages eventually reach the critical level and the decision of the financial group is carried out.

The attempts at actual forecasting seem to be complicated mathematical or advanced statistical methods. These will be discussed in the last section.

**Price Ratio Data**

Timing is a very important factor in the market. An unerring characteristic of most major market advances is an increased desire and willingness of people to take risks. As confidence rises, lower quality stocks are bought. It is believed that in the early stages of
a bull market attention is on the "blue chip" stocks; as the market progresses the public comes in and buys the speculative issues and, at the crest of the market, speculation is very large. After the market reaches its peak, public confidence declines and speculatives drop in price very quickly.

This theory is well supported by facts. Since 1926 the low-priced stocks did better than the high-priced stocks in 1929, 1933-34, 1937, 1946, 1949, and 1955. Such uniformity is rare for a technical factor. After May 1955, to the end of the year, sentiment shifted from smaller companies to the fifty largest corporations. But this was one of the few exceptions from 1926-56, a thirty-year period.¹

Molodovsky's Index of Confidence. This index was developed by Nicholas Molodovsky, one of the better known analysts on Wall Street and author of a number of books and articles on technical analysis.²

To gauge the effect of psychological forces on stock prices, he constructed two lists of stocks, one representing more exactly than the Dow Jones industrials the investment issues, and the other representing more exactly than the entire list of stocks, the low-priced speculative issues. One he calls the value stocks, the other the

¹Leffler, op. cit., pp. 560-561.

vision stocks. The two lists are made up in pairs, matched by industries and in every possible respect except price and quality, in which they differ widely.

The more volatile vision stocks normally diverge in price more widely from their "values." Thus impairment of investors' and speculators' confidence is indicated when, in a rising trend, vision stocks go up relatively less than value stocks. To get a sensitive "Index of Confidence" Molodovsky keeps a ratio of the averages of vision stocks divided by value stocks.

He also keeps a ratio of the volume of vision stocks to the volume of value stocks since he feels that differential analysis of the activity of transactions reveals more of the trend-building and trend-disintegration process for which he has developed a complete theory. Still other statistical series are used as adjuncts.

This index had been examined by A. W. Jones, back in 1948, and he pointed out that Molodovsky missed about half of the 26 point upmove from May to July 1947 and fell into serious error in missing the entire upmove of 30 points in the Spring of 1948. 1

With these important exceptions, his predictions have been nearly perfect, up to 1949, even with respect to most of the minor moves, and with his main indexes worked back to 1937, it looks as if it would have been just as effective for the earlier ten years.

The writer was unable to locate any later references to Molodovsky's Index of Confidence after 1949. It is quite possible that after its failures in 1947 and 1948 that it fell into disrepute and is no longer used.

Dr. John C. Clendenin, of the University of California, investigated this problem by using stocks grouped by quality in the Monthly Fitch Stock Record and in the Monthly Financial World Independent Appraisals of Listed Stocks. He tested their price changes over the period of 1937 to 1948. He concluded:

... the percentage price fluctuations in most low-priced stocks are about the same as those in high-priced stocks of the same quality. The price instability which characterizes so many low-priced stocks should be attributed to their speculative quality, not to the fact that they are low-priced. 1

This could possibly explain the flaw in Molodovsky's Index in that he assumed that a low-priced stock was necessarily a low-quality stock.

DeGoumois' Deviation Index. The general assumption on which the DeGoumois' Deviation Index is based is that the stock or industry group which are the market leaders, because they have gained the most aggregate of their own gain over the price movement of the aggregate, and the during the past phases of a bull market, should go on acting better than the stocks or industry groups. Once they begin to falter and show a consistent and extensive failure to maintain their greater percentages which have failed to keep pace with the rest of its class or

forward momentum, this is a pretty good sign that the major trend of the stock market has changed or is changing.

All stocks are constantly being investigated and appraised by experienced analysts and investors. As a result, stocks which have risen the most during a bull market sooner or later begin to look less attractive than the slower moving stocks. There will be a gradual switching from leaders and their forward momentum will be reduced and, as the market moves toward a climax, the momentum may lag and the lag can be measured. This is a natural process which has been observed during every bull market since 1918. The reverse is true during a bear market.

A three-way ratio was developed among the thirty most important industry groups listed in Standard and Poors' classification. These are arranged into three equal divisions according to each group's maximum percentage gain or loss from its previous bear market low or previous bull market high.

The ten groups showing, as of a given time, the greatest maximum percentage changes are bunched together and form the high velocity aggregate. The next ten form the medium velocity aggregate, and the ten groups showing the smallest maximum percentage changes form the low velocity aggregate. This classification is always fluid because it is immediately revised whenever a faster moving industry group overtakes one which has failed to keep pace with the rest of its class or which has failed to make new highs for some time. Because of this
constant reshuffling, the thirty industries reflect immediately any change in the economic and price patterns of the stock market. There is no risk of getting wrong signals due to a stale or unrealistic velocity classification.

Based on this principle, a Deviation Index is constructed. This index, according to its developer, "An index based upon a very old trigonometrical principle is used to compute the result of the three-way interplay and relationship among the three velocity aggregates."

The operating procedure appears to be fairly simple. When the three velocity aggregates move up or down at the same rate, the resulting trigonometrical measure will remain substantially unchanged. But if the high velocity aggregate should move up, as it normally does during a bull market, at a faster rate than either of the other two aggregates, then this ratio, which is called the Deviation Index, will move up also. On the other hand, if the high velocity aggregate should remain unchanged while the others are moving up, or if it goes down while the others go up or remain unchanged, then the Deviation Index will go down. The Index will have a normal tendency to drop in a bear market because the ten groups in the high velocity aggregate are there on account of their having lost proportionately more ground than the other groups.

---

A few principles of interpretation have been listed by the author:

... it has been found, on the basis of reconstructed patterns going back to 1918, that when deviations constitute a trend reversal amounting to 8 points—in terms of Deviation Index—this is a pretty reliable indication that the trend of the market has also changed.1

1. The major stock market trend is downward when the Deviation Index has lost more than 8 points from the highest level it had reached subsequent to the occurrence of a major uptrend signal, and 2. The major trend of the stock market is upward when the Deviation Index has gained more than 8 points from the lowest level it had touched subsequent to the occurrence of a major downtrend signal.2

The author claims that a follower of the Index, by buying and selling at the points indicated, would have gained 1,002 points as measured by the Dow Jones industrials in the period from February 4, 1920, to September 12, 1956.3

Hood's group action. The basic idea of determining market strength or weakness through analysis of its component sections has been carried out from a still different point of view by Oakman Hood.4 He uses price indexes of thirty-eight stock groups, such as steels, oils, rubbers, and so forth. Although primarily designed to show which groups are the best buys or sales at any given time, further refinements of group action have been employed in order to gain some indication of probable market action as a whole.

Hood compares his groups with the Dow Jones industrial average.

1Ibid.  2Ibid.  3Ibid.  4Drew, op. cit., pp. 85-89.
Since some groups like the steels habitually move more than the average and others like tobaccos move less, the price change of each group is first adjusted for its normal volatility. The theory is that, if fewer and fewer of the groups on an adjusted basis are failing to keep pace with the averages, it is a sign of market weakness.

The logic is apparent to anyone familiar with market characteristics. The last stage of a bull market is marked by spectacular strength in a few groups and individual stocks under cover of which the majority of stocks are sold or "distributed." The group analysis is just another way of getting at the subsurface condition.

Recognizing that volatility characteristics of groups and/or individual stocks are subject to change, the volatilities of the basic thirty-eight groups are analyzed each month for that particular period. Thus the nineteen most volatile and the nineteen least volatile are determined. The relative action of these two group classifications are compared not only with the Dow Jones industrial average, but also with each other, the results being combined by a mathematical formula into a new group action index.

**Volume Ratio Data**

Analysis of the volume of trading is one of the oldest technical tools. Trading volume is assumed to be the measure of demand for stocks in a market advance, and the supply of shares in a decline.

**General theory.** The general theory of volume analysis is that
an advance in stock prices accompanied by an increase in sales volume reflects increasing confidence. More and more people are buying more and more stocks. A rise in stocks accompanied by a decline in volume reflects, on the contrary, a relative loss of confidence. The advance reflects the purchase of fewer shares of stock by fewer investors. The same reasoning applies to market declines. A decline accompanied by a substantial increase in volume suggests insistent selling by numerous investors with many shares for sale. A decline accompanied, on the other hand, by a slight increase or, perhaps, by a decrease in volume suggests a lack of confidence in the certainty and strength of the decline. Only few people with relatively few shares are depressing the market.

Julius Grodinsky, Professor of Finance of the Wharton School of Finance and Commerce, maintains: ... (p. 424.)

<table>
<thead>
<tr>
<th>if volume</th>
<th>while prices</th>
</tr>
</thead>
<tbody>
<tr>
<td>up</td>
<td>increases</td>
</tr>
<tr>
<td>up</td>
<td>decreases</td>
</tr>
<tr>
<td>down</td>
<td>increases</td>
</tr>
<tr>
<td>down</td>
<td>decreases</td>
</tr>
</tbody>
</table>

Quinn's moving volume curve. Investment advisory associations make use of the volume of trading in making their recommendations about the market. Edwin S. Quinn of Investographs, Rochester, New York, uses two indexes based on trading volume, price entering in only to the extent that the implications of the volume analysis are considered in relation to the price trend. He prepares a moving volume curve, which is a six-week moving average of weekly volume of trading, and compares it with that of the average price movement.

Quinn's selling signal is:

The moving volume curve will reach its peak some time ahead of the stock market, usually when about 75% of the major advance has been completed. But because a long bull trend is the nature of a moving force, its own momentum will carry it to its ultimate top despite inadequate volume support.¹

His buying signal is:

In a major decline, volume should decline more or less proportionately with price. When volume and price finally do fall into gear on the way down for not less than four weeks and when the volume curve drops below a previous price reaction, low point, a buying signal is given.²

As a supplement to this Quinn prepares an "Investment Activity Index." He prepares a ratio of the volume of transactions in a group

¹Drew, op. cit., p. 77. ²Ibid.
of investment stocks to total trading on the New York Stock Exchange. Thus the ratio represents the per cent of investment transactions to total turnovers. When high, the interest indicated in investment stocks is regarded as a factor of market strength. A drop, suggesting activity in speculatives, is an element of weakness. The ratio is placed on a moving average basis.

Drew, writing in 1948, tells how Quinn has reconstructed his moving volume curve back to 1919. He goes on to say that:

The hypothetical record appears to be excellent with two exceptions. One is a premature "Sell" in mid 1925, not followed by a countermaning "Buy" formation until a year later at about the same price level. The other is a purchase indicated in August 1931 which would have resulted in a loss being taken later in the year as a resumption of bear market action.¹

Mindell pointed out the value of volume analysis in his works:

As long as prices continue to move in proportion to the volume, the forecast is for continuation of the move. Increased volume together with decreased price progress constitute a warning of reversal or correction. If this occurs in an advance it indicates that the market is running into as much stock as can be successfully absorbed at that level.²

He used volume to show the direction of the trend and to judge the quality and character of supply and demand areas around previous points of resistance and support. In addition, it helps in identifying zones of accumulation and distribution.

¹Ibid., pp. 81-94.
²Mindell, op. cit., p. 19.
Volume provides a valuable measurement for stock market analysis. It is most effectively used on a broad scale. Market moves consist of marked waves. It is simple to compare how the volume on a wave compares with the volume of its predecessors. In a bull market the volume peak usually occurs before the price bottom. One of the most interesting revelations of the business cycle study of the National Bureau of Economic Research was the discovery that the volume line was usually one of the earliest economic series to turn down at cyclical stock market tops.¹

Examination of volume theory. Upon examining the volume theory the writer was unable to verify Mindell's source for this last statement. However, an article in The Commercial and Financial Chronicle, written by Mindell and Nicholas Molodovsky, included the following:

Both stock price and volume are among the most sensitive components of the cycle. This has been established by the extensive and detailed studies of the National Bureau of Economic Research.

In "Measuring Business Cycles," Arthur F. Burns and Wesley C. Mitchell point out that in the 16 cycles between 1878 and 1933, share trading led the downturn in 14 cycles and the upturns in 11. In 19 business cycles from 1858 to 1883, stock prices have led general business 13 times on the downturns, and 14 times on the rises.²

From this it would appear that volume would be a good indicator of the turning point of the business cycle and its only relationship with stock prices would be that frequently they both turn in advance of the business cycle. This would leave unsolved the problem of

¹Ibid., p. 197.

forecasting stock price movements if they both turned together.

Burns and Mitchell showed a chart comparing a number of economic time series. One of the comparisons was that between rail stock prices, by months, with round lots of shares traded on the New York Stock Exchange, by months. This is sales of one hundred shares or more and it will average about 90 per cent of the trading over the period from 1875 to 1933. The cyclical turning points of the shares led the rail stock prices nine times, lagged twelve times, and coincided with it eight times, and the shares traded included one peak and trough not reflected by the stock prices.¹

With this irregular relationship, volume of trading couldn't be a very good indicator of the railroad stock price movements.

A later study along these same lines was made by George Leffler and Richard Dennis who are both professors at Pennsylvania State University. The purpose of their study was to determine the correlation between the level of prices of the Dow Jones industrial averages and the volume of trading on the New York State Exchange. Is there any correlation between the two series and how much? Does volume really increase in a bull market? Is there any correlation during a bear market?

Correlation as used here means the relationship between values of two characteristics or attributes of a group, such as between the

height and weight of individuals. A correlation of 1.0 is perfect.

For example, suppose a 10 per cent rise in stock prices always had a 10 per cent rise in volume. This would be perfect correlation.

The period under study was from 1934 to 1955. In the five bull markets which occurred in that period the coefficient of correlation was only .4462. This meant that there was only a fair amount of correlation between the two series and that the relationship had little practical value.

The correlation in the four bear markets in that period was .2422 which had no value at all.

They concluded:

In summary the old adage "Volume goes with the trend" appears to have little validity and should be disregarded by the intelligent trader. In an occasional bull market the correlation is high, but in most it is too low to be useful. Such erratic behavior cannot be a sound basis for either speculating or investing.1

Regarding the principle that "volume is the measure of demand in an advance and supply in a decline," A. W. May, financial writer for The Commercial and Financial Chronicle and a staunch opponent of technical analysis, pointed out a fallacy:

... there is no explanation evidenced of why large volume on the way up may not just as likely be an indication of intelligent selling instead of buying, and hence be a bearish rather than a bullish signal and vice versa, during a price decline, why diminishing volume may not just as likely be manifesting buying as selling weakness, and hence bearish instead of bullish.2

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He went on to say:

As a matter of fact, two of the most popular services specializing in this for timing operations in individual stocks happen to be based on just the alternative conclusion which we have suggested. These particular systems measure "buying power" and "selling pressure" in inverse ratio to the accompanying volume of trading. Thus greater volume for the same amplitude of an upswing is deemed to denote greater selling, not buying pressure.¹

It would seem from the preceding, then, that volume would not be too satisfactory an indicator to use as a forecaster of stock prices. Perhaps its greatest use would be to forecast the business cycle.

Figure 3, comparing a six-week moving average of volume with a six-week moving average of the Dow Jones industrials, for the period May through December, 1959, shows that the volume reached a peak nearly three months before prices. And after the decline, volume turned up one month before prices.

The chart agreed with the theory in that a decrease in volume while the prices rose indicated a drop in the market. This turned out to be correct. Later an increase in volume and an increase in prices indicated that the further trend of the market should be upwards. This proved to be correct also.

In this instance the events coincided with the theory and it would have helped an investor to time his purchases and sales. However the time period was too short for an adequate test and, in view of the other tests showing that volume is not a good indicator of stock prices, the writer would urge caution in following this in investing.

¹Ibid.
Figure 3. Comparison of a six-week moving average of the volume of shares traded on the New York Stock Exchange with a six-week moving average of the Dow Jones Industrials, 1959. (Based on data from The Wall Street Journal.)

Dow Jones Industrials

Volume

Shares traded in thousands

May

June

July

Aug.

Sept.

Oct.

Nov.

65
660
655
650
645
640
635
630
625
620
615

5

10

15

20

25

30

35

40

45

50

55

60

65

70
Breadth of the Market Data

Technical analysis has devised a number of techniques and procedures for studying the so-called internal structure of the market. If a market rise has been established from a broad base with a great many issues, in a number of groups, increasing in price and a steadily increasing volume of shares being traded, it is believed that the upward trend will continue for a period of time. Whereas, if the advance is caused by spectacular increases in only a few issues in a few groups of stocks, it is believed that the market could reverse itself quite rapidly.

One of the difficulties encountered in studying the market movements is the faulty indexes used to measure its progress. The best known averages, the Dow Jones industrials and the Dow Jones rails, use 30 industrial stocks and 20 railroad stocks to measure the movement of the approximately 1,600 stocks listed on the New York Stock Exchange. The market could be showing spectacular advances, as measured by the industrial averages, merely because of the method of their construction. If one or two of the dominant stocks like American Telephone and Telegraph should advance two or three points, and the majority of the rest of the stocks which were not included in the Dow Jones industrials, drop in price, the averages would still indicate that the market had advanced for the day.

Advances and declines. To overcome this difficulty and enable the investor to determine if the market movement is on a very narrow base and is only represented by a few stocks or if the movement is
broad and encompassing a great number of stocks, ratios are kept of the advances and declines, each day, to the total issues traded.

It was described in the second chapter how the inertia in stock prices tends to cause a movement to continue once it has been started. For this reason, these indexes give valuable clues as to the breadth of the movement to enable the trader to make an educated guess as to the likelihood of the movement continuing.

These also show underlying deterioration or improvement through their action in relation to that of the market. When the ratios are placed on a seven-day moving average, they will be found to fluctuate around a center line of about forty with extreme limits at approximately twenty and sixty. Reaching such extremes is often an indication of an intermediate top or bottom.¹

On the following page, Figure 4 illustrates the ratios of advance and declines to the total number of issues traded for each particular day. In addition is a chart of the closing prices of the Dow Jones industrials over the same period of time which is from May through November, 1959.

The chart indicates two definite divergencies. Early in June they move apart, reaching a separation peak, for the advance and declines, on the 9th. During that period the Dow Jones industrials had dropped from 643 to 617. On the 10th they move together and by the 11th they

¹Drew, op. cit., pp. 89-94.
Figure 4. Ratios of number of issues advancing each day to issues traded and number of issues declining each day to issues traded compared with the Dow Jones industrials, 1959. (Data from The Wall Street Journal)
are fairly close together and it is then that the industrials start climbing to their ultimate peak of 678 on August 3.

From their peak of 678 the Dow Jones industrials started to drop, reaching a low of 616 on September 22. Meanwhile the advance and decline ratios reached a separation peak on September 10, began to move together and then reached that peak again on September 22. From there they began to move together and the Dow Jones industrials started their long climb to a year-end all-time high.

An analysis of this chart would indicate, for the period covered, that the advance and decline ratios do not indicate a break in the market but, after a break has occurred, they served to signal a change in the trend.

**New highs and new lows.** These indexes are seven-day moving averages of the daily ratios of the number of new highs and lows to the number of issues traded that day. The indexes of new lows is shown on an inverted scale and should characteristically move in the same direction as the index of new highs. The picture illustrates in still another way the progressive deterioration in market price structure during the period covered.

These indexes do not always show a picture week in and week out. Nevertheless they are particularly valuable in the broad areas when the major trend is about to change, because they then reveal the degree of underlying strength or weakness.
Sometimes the attempt is made to reduce such indexes to a rigid "system" with signals assumed to be given when the extremes are reached. That is a dangerous procedure because there will almost inevitably be premature signals early in any really dynamic move. As in the case of new highs and new lows the advance and decline ratios should be used on an interpretative basis and regarded simply as one of the several approaches which are helpful in determining the character of the market.

The accompanying chart, Figure 5, shows how the highs reached a little peak on May 22 and then turned down. An examination of the chart of the Dow Jones industrials, found on page 93, reveals that they reached their peak on May 29 and turned down. The highs reached a major peak on July 8, held it for two more days, and then turned down. The DJIA continued its climb until August 3 and then turned down, reaching its low on September 22.

The index of highs reached their low point at the same time and began to turn up.

Both of the moves of the highs were confirmed by the index of lows.

From comparison of the two charts of the advance and decline ratios and the new highs and new lows with the DJIA, for the summer of 1969, it appears in these cases that the highs move down in advance of the downward turn of the DJIA and the advance and decline ratios move together ahead of the upward turns of the DJIA.

This situation would certainly merit additional study over much longer time periods.
Figure 5. Ratio of issues reaching new highs for year to total issues traded, for that day, compared with ratio of new lows, 1959. (Ratio of lows is charted on inverted scale to the right. Data from The Wall Street Journal)
Breadth-index theory. The breadth-index theory injects into market projections an element that market analysts are generally disregarding: the element of money, or the cost of money.

There are approximately 1,600 securities listed on the New York Stock Exchange. It is possible to approximately divide these into securities of investment quality and securities which are essentially speculative. The first are stocks which have a steady market and whose growth is unspectacular. Included in this group would be a great many preferred stocks, the better type defensive securities, and the so-called money-rate issues. In this group are gathered the common stocks whose dividend is safe, but which lack, at least at that moment, the romance of probable higher prices. The speculative issues, on the other side, are highly volatile and popular securities in a market which may very well be wild with emotional and uncontrollable gyrations.

Not all of the stocks on the New York Stock Exchange are traded every day. The number of the securities traded may vary from 1,200 to 1,300. Of these, a certain number will advance and a certain number will decline. Others will reveal no price change.

<table>
<thead>
<tr>
<th>Date</th>
<th>Issues Traded</th>
<th>Advances</th>
<th>Declines</th>
<th>% Advances</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1,230</td>
<td>614</td>
<td>393</td>
<td>49.9</td>
</tr>
<tr>
<td>2</td>
<td>1,231</td>
<td>570</td>
<td>417</td>
<td>46.3</td>
</tr>
<tr>
<td>3</td>
<td>1,247</td>
<td>523</td>
<td>508</td>
<td>41.9</td>
</tr>
</tbody>
</table>

Given the picture above, there were the following advances during the three days: 49.9 per cent of the issues traded, 46.3 per cent,
and 41.9 per cent. These would be compared with the average of the
daily gains over a certain period of time. For example, if the average
had been 42 per cent then the net advances and declines would be as
follows:

<table>
<thead>
<tr>
<th>Date</th>
<th>% Advance</th>
<th>Average Advance</th>
<th>Net Advance</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>49.9</td>
<td>42.0</td>
<td>7.9</td>
</tr>
<tr>
<td>2</td>
<td>46.3</td>
<td>42.0</td>
<td>4.3</td>
</tr>
<tr>
<td>3</td>
<td>41.9</td>
<td>42.0</td>
<td>-0.1</td>
</tr>
</tbody>
</table>

This is the breadth-index, the positive and the negative gap
existing between the percentage of stocks rising each day and the aver-
age for the period. Those who subscribe to the breadth-index theory
find that the curve indicating the net changes in the percentage of
gains and declines follows very much the line of the individual averages.
From time to time, however, there is a divergence between the two curves
and it is precisely these divergences which are looked upon by the
analysts as particularly important.

According to the theory, the explanation for this divergence
must be found in the stocks having investment quality: the preferred
stocks, the high-class defensive stocks, and the money rate stocks.
These securities are bound to be intimately connected with the course
of interest rates. As money rates rise, such securities are inclined
to fall. All periods of speculative enthusiasm are accompanied by
an increment in the cost of money. While then the speculative issues
gain in appeal with any increase in the market's ebullience, the
investment-quality stocks lose their popularity and are relegated to a background role. It is, therefore, possible for the market to reveal at the same time this contradiction: an increment in the averages and a decline in the breadth-index. This is a danger signal because a reversal is to be expected.¹

Lowry's buying power and selling pressure. This is based upon measurements of the daily gains and losses of all actively traded stocks relative to the volume of trading in these same issues. The basic concept is that if 10,000 shares are required to move a stock up 3 points, and the same upward move was made before on volume of 1,000 shares, the market rise is presumed to be meeting resistance, and the foundations of the boom have weakened.

The method of the Lowry indexes of buying power and selling pressure is to divide the total gain on all the stocks showing plus signs for the day by the volume of trading in these same issues, which results in a calculated average gain per share. The same calculation is applied to all issues showing minus signs for the day, and both indexes are plotted in the form of moving averages. A rise of the "buying power" index carries bullish implications, while a rise in the "selling pressure" index has the opposite meaning.

The only test that the writer was able to locate was by R. D. Merritt, where he told how this system gave clear-cut buy signals at

¹Flumiani, op. cit., pp. 44-46.
the bottom of the bear market in 1942, and profited users well in the following four-year rise. Early in 1946 it warned of subsurface weakness and highlighted the heavy volume of trading which failed to move prices up very much, suggesting that the market was less strong than the industrial average indicated.¹

**Mills' buying and selling.** A number of methods have been developed which seek to combine the volume of trading with the gain or loss in prices.

The Mansfield Mills Company uses procedures similar to Lowry. The difference is that the two major indexes representing buying and selling are derived from the dollar values involved in price changes rather than the price changes themselves.

The total of dollar value gains is computed for a given day by adding the points gained in each individual stock that advanced, multiplied by its volume of trading. Thus the gain for a 2 point advance on 5,000 shares is $10,000.

The total of all dollar value losses is calculated the same way, and then each is divided by the total volume of trading for the day; this gives the "gain-ratio" and the "loss-ratio" for that particular date.

These are placed on a moving average basis for the final indexes of buying and selling. It is evident that such indexes will be close

¹Merritt, op. cit., p. 270.
to the Lowry indexes. The Mills method also uses a shorter term moving average, but based on the loss-ratios and referred to as short-term selling intensity.¹

Both Lowry and Mills methods are sound and logical approaches to analyzing the market. Occasional whipsaws and losses will inevitably occur, but, by nature, they can never be seriously wrong on important trends.

Other records can be kept of the total issues traded. This will also tend to indicate if the market movement consists of a large number of issues or a small number.

Trading Ratio Data

A theory of contrary opinion holds that the market may be operating under the influence of either one of two forces: the leadership of those who know or the leadership of those who do not know, that is, the professionals or the public.

Those who know have the money, can wait, and, above all, have a good working knowledge of the market or, not enjoying such knowledge, know how to go to the sources and obtain the information they need. Their information may come from books and directories, or it may come directly from the very directors and officers who manage the affairs of the corporation.

¹Drew, op. cit., pp. 70-72.
The leadership of those who do not know, on the other side, is composed of men who have little money, cannot wait, and are ignorant of market action. These people do not know how to go to the sources. When they go, they do not understand what they read. Normally, they are too lazy even to take the books in their hands. They act on tips and follow the masses in the market.

When the market is under the leadership of this second force, the market's leadership is a very weak one. The foundation and structure of the market have dangerously deteriorated.

It is believed that it is possible to identify the periods when the market is under the leadership of those with no money, no time, no knowledge, and who cannot wait, by their volume of orders. These are the individuals who cannot afford to buy a full unit of shares. They buy less than one hundred shares. They are the odd lotters.

Odd-lot indexes. Based on the cynical assumption that the public is always wrong, is a forecasting method which employs the odd-lot purchases and sales as its indicators. These are combined to form the odd-lot indexes. Garfield Drew popularized the method and has been one of its leading practitioners.¹

It was generally considered by Drew that (1) the public tends to buy heavily on balance near the close of a bull market; (2) it buys heavily on balance after the close of a bull market, as stock prices

¹Ibid., pp. 205-234.
deteriorate; (3) it shows no marked skill in buying on balance at the bottom of a stock cycle; (4) it frequently sells on balance in the early months of a bull market; and (5) it engages in premature profit taking.

These observations would seem to point to considerable evidence that "the public is always wrong!". It buys stocks of high quality but its timing is poor.

Drew believes that changes in the market sentiment of the public can often be measured with reasonable accuracy by studying the figures of odd-lot transactions. It is not the number of shares purchased daily exceeding the shares sold, or vice versa, that is important, but the proportion of buying or selling to each other. Most important is the fact that the trend of sentiment as indicated by the odd-lot balance of trading is more important than the side on which the balance lies. Odd-lot trading will be well on the buying side at the bottom of a drastic decline, but it will be proportionately less so than it was on the way down. The converse is true with respect to odd-lot selling on a top. Thus, although the public is never "wrong" in the sense that it buys around every bottom, it is almost invariably wrong in that it buys proportionately less at the bottom than it did on the way down. Similarly, as an advance progresses toward its peak, selling may either become less or change to actual buying. A change of sentiment on the part of the public after any market trend has become well established is almost always just the opposite of what it should be.
Four indexes have been constructed by Drew to measure the "changes in market sentiment." The most important is based on the ratio of odd-lot selling to buying; the next compares odd-lot transactions to the entire market volume; the third compares odd-lot short-sales to odd-lot sales; and the last index is constructed by dividing the odd-lot sales by the number of orders to sell which gives the size of the average selling order.

The last three indexes are used to confirm the results of his first and most important index, the Major Balance Index.

The Major Balance Index is a ten-day moving average of the daily ratios of odd-lot selling to buying. This index rises when odd-lot trading either tends toward the selling side or the amount of selling increases. The figures fluctuate around one hundred, which represents perfect balance between buying and selling. This is placed on a chart along with the Dow Jones industrial average for convenient comparison.

When all four indexes show a rising trend against any market declines, it has bullish implications for the market and vice versa. Uptrends and downtrends in the indexes are significant only when they appear as diverging from the trend of stock prices. When they move parallel to the trend, it means the odd-lot public is normal; when it becomes abnormal it is indicating a change of sentiment which will almost invariably prove wrong.

Drew concluded that the indexes have been more decisive in their indications of bottoms than tops.
On the record is that during the course of violent and straight-
way declines, they have always prevented premature buying and have
come very close later to indicating the exact bottom.

The Major Balance Index has been excellent in showing when the
market was entering upon final bull or bear market phases. No
decisive divergences has ever proved wrong as far as a temporary
reversal of trend was concerned.\(^1\)

This statement was based on data secured during the brief period from
March 1936 to 1948.

An analysis of odd-lot trading was made by C. O. Hardy for the
Brookings Institution. His study covered the period from 1928 to 1938.
During this period he noted, "In general unless either the net balance
or the price change was very small, the public net sales were followed
by price advances, and public net purchases were followed by price
declines."\(^2\) But upon completing his analysis he concluded:

In the writer's judgement, however, the correlations have little
or no real forecasting value, because a forecast based on the behavior
of the odd-lot public would be substantially the same as one based
on the movements of the market itself. Our comparisons reflect
two facts: first, that the public usually buys on breaks and sells
on advances that are big enough to show in the monthly averages;
and, second, that swings of this magnitude generally run in the
same direction for a number of months, so that the average results
are dominated by the cases when the public bought in the first
part or middle of a downswing and sold in the first part or mid-
dle of an upswing. . . . Thus the tendency of the odd-lot public
to be wrong if its trading results are tested by the price movements
of the next few months, is largely accounted for by the tendency
of prices to change in the same direction for several consecutive

\(^1\)Ibid., p. 233.

\(^2\)C. O. Hardy, Odd-lot Trading on the New York Stock Exchange
months, coupled with the propensity of the public to buy on breaks and sell on advances.¹

Professor Leffler arrived at a similar conclusion, in his volume on the stock market, when he stated:

The odd-lot public may be wrong at times, just as professional traders are wrong; but they aren't always wrong. And they may be right enough to spoil any prediction based on their actions. The actions of no class of traders are so consistent as to be infallible guides to market behavior. In addition their behavior may be such as to indicate no trading signals at all.²

From these studies it would appear that Drew's methods of forecasting are not based on a very firm theoretical foundation; nevertheless he maintains an investment advisory organization based on just these principles.

On the next page, Figure 6, comparing the ratio of odd-lot selling to buying, from May through November 1959, shows that there was selling at the market peak, late in May and in July, and that buying started after the market reached a low point in September.

From this brief record it would appear that even though the public bought more than they sold, for the entire period, they knew at the proper time when to sell and when to increase their buying.

Short-sales. Similar to the odd-lot methods of forecasting are those based on the short-sales.

The term short-sale means any sale of a security which the seller does not own or any sale which is consummated by the delivery of a

¹Ibid. ²Leffler, op. cit., p. 560.
Figure 6. Comparison of ratio of odd-lot selling to buying with Dow Jones industrials, 1959. (Data from The Wall Street Journal)
security by, or for the account of the seller. The purpose is to sell the stock with the idea that it can be purchased again cheaper at a later date.

Beginning with the assumption that the public tends to be most bullish at the top and bearish at the bottom of a market cycle, a large and rising short position is a sign that many people expect the market to decline. This public caution is assumed to be a bullish sign, because the public is usually wrong. Conversely, a small or diminishing short position in a high market is a warning that the rise may be nearing an end. There are too many optimists around for comfort. Those who are short stocks eventually have to engage in covering operations, so a high short position indicates a big backlog of buy orders.

The short-interest figures are expressed as a percentage of total stocks traded during the month and placed on a graph with the Dow Jones industrial average for easy comparison. When this short-interest indicator dips well below one per cent, the market is quite likely to be a sale, and when the indicator rises well above one per cent, stocks are usually a buy.

Too much reliance shouldn't be placed on short-interest and short-selling as technical factors. One reason is that the amount is very small. In 1955 it was only four per cent of all sales on the New York Stock Exchange.\(^1\) Short-selling is done for reasons other

\(^1\)Ibid., p. 559.
than speculation, thus it would have no speculative significance. Short-sellers have made many bad decisions. There was little short-selling in 1946 when the stocks were overpriced and there was a great deal in 1949 just before the start of the 1949-56 bull market. Because of this bad timing it is difficult to tell the precise effect of short-selling and short-interest on the market.

There appears to be little correlation between the volume of short-selling and the movement of stock prices either for individual stocks or for the market as a whole. In the careful study of short-selling by Macaulay and Durand, a comparison was made with the short-interest and stock prices from 1931 to 1939. Their conclusion was that "over the whole period covered there is no apparent tendency for the total short position to show either a direct or an inverse relationship." This same conclusion held in an analysis of a number of individual stocks as well.

In conclusion, any trader who relies upon short-interest statistics to build a sound method for stock trading is doomed to many disappointments. Short-selling today is a minor influence in the determination of stock prices and its timing is such that it has no ascertainable effect on prices.

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the next logical step was to search for regular fluctuations or cycles.

A number of scientific studies have been made and various conclusions reached regarding the length of the cycle. Dow believed that the length of the primary movement would be at least a year and generally much longer, perhaps as much as four years. Hamilton, with a much greater volume of statistics, in reviewing the period from 1900 to 1923, concluded that the average bull market ran twenty-seven months and the average bear market extended to only fifteen.\(^1\)

Dewey and Dakin, in their analysis of various economic series, found several cycles of varying length pertaining to the stock market.

In our stock market, as well, as in commodity, we find evidence of an approximate 9-year rhythm clearly stated.\(^2\)

A rhythm that has repeated itself as many times (10) and as regularly as this one cannot easily be the result of pure chance.\(^3\)

In addition they found a shorter cycle:

Clearly indicated in the Federal Reserve Index of Industrial Production, in pig iron production, in common stock prices, in scores of other production and price series, runs a rhythm that has been variously estimated at from 39 or 40 to 42 months in length.\(^4\)

They also found indications of a 54-month cycle in stock prices but this was not as apparent as the other two cycles.

\(^1\)Leffler, op. cit., p. 539.


\(^3\)Ibid., p. 91.

\(^4\)Ibid., p. 102.
Recent studies of the stock market have increased somewhat these earlier estimates of the length of the stock cycle. A Senate Staff Report in 1955 computed an average cycle of four years since the Civil War, with individual cycles ranging from two to ten years.¹

In the first fifty years of the twentieth century, the average bull market has been about two and one-half years and the average bear market one and one-half years.²

Various approaches are employed to capitalize on the existence of these cycles. Major market price trends tend to run with the business cycle. Therefore some traders attempt to time their purchases with the business cycle. The difficulty with this procedure lies in determining the point at which to sell because the stock prices tend to move in advance of the business cycle. One authoritative study concludes, on the basis of a comprehensive examination of the underlying data, that stock prices usually decline in the last third of a business boom and advance in the last third of a business depression.³ This study is of little use as a guide to the investor. It does not lay down any standards to enable him to identify the time of arrival of a new phase of the business cycle, or to determine the time interval

²Leffler, op. cit., p. 559.
³Burns and Mitchell, op. cit., p. 595.
between the arrival of such a cycle and the prior movement of stock prices.

Predicting stock market prices with the aid of business cycle forecasting is unsatisfactory because this forecasting itself lacks solid foundation. It is unreasonable to expect from an economist, in our present economic system, a reliable forecasting of business cycles. The ever-present chance of government intervention makes that impossible and that is only a minor part of the problem.

But even if business conditions could be more reliably forecast the problem of stock price trends would not be completely solved because the movement of security prices is not exclusively governed by the anticipation of business conditions.

With the realization that stock price trends do not exactly coincide with the business cycle and that even if they did, the business cycle is almost impossible to forecast with certainty, students then turned to a scientific analysis of the common stock cycle to ascertain its length and shape.

Three general methods have been employed: mathematical, statistical, and graphical methods.

Mathematical. There is a very simple technique for analyzing any curve, no matter how complicated it may be, into its constituent simple harmonic curves. It is based on a mathematical theorem known as Fourier's Theorem, after its discoverer, J. B. J. Fourier, the famous French mathematician.
The theorem says that every curve, no matter what its nature may be, or in what way it was originally obtained, can be exactly reproduced by superimposing a sufficient number of simple harmonic curves; in brief, every curve can be built up by piling up waves.

The theorem further states that one need only use waves of certain specified lengths. If, for instance, the original curve repeats itself regularly at intervals of one foot, one needs only to employ curves which repeat themselves regularly 1, 2, 3, 4, and so forth, times every foot, i.e., waves of lengths 12, 6, 4, 3, and so forth, inches.

If the original curve does not repeat regularly, its entire length is regarded as being the first half-period of a curve which does repeat, and thus the theorem is obtained in its usual form.

This was the basis of the technique employed by Professor Harold T. Davis in studying the Dow Jones industrial average and detecting the forty-month cycle which was described in the second chapter of this thesis, page 26.

He presented evidence of periodicity in stock prices by means of Schuster's periodogram analysis, and has attempted tests of the significance of these periods by R. A. Fisher's technique. 1

Continuing his study, stock prices were analyzed from intervals of one day to intervals of fifty years, so that a complete spectrum

of this series is now available. Davis said:

This chapter, then is to be regarded as a working summary of all that we know at the present time about the harmonic variation of economic time series, when the analysis is confined to a rigid periodogram of the type first extensively used by Sir Arthur Schuster, all variants of this method, which strive to give greater freedom to the analysis of harmonic patterns, must derive their first approximation of structure from such periodograms as those presented in this chapter.¹

A periodogram is a curve which exhibits graphically the periodicity of any natural or physical phenomenon.

At the risk of repetition, he stated: "The conclusion is inescapable that the 40-month component in the years from 1914-1924 was a very dominating pattern of the stock price series and large profits could have been made by forecasting with this single cycle."²

In a discussion of this technique by Alfred Cowles, he said:

... By this method, however, only average periods can be found and even then their significance can not be accurately determined because of uncertainty as to the independence of observations.

There seems to be no way of determining the probabilities of significance in connection with this method.³

There have been a great many attempts to develop equations or project curves of market action into the future as an aid to forecasting, but the writer of this thesis was unable to locate any evidence attesting that the methods were successful.⁴

¹Davis, op. cit., p. 326. ²Ibid., p. 292.
In a study of one hundred years of stock prices, a different method was used by F. B. Daniels in his search for periods. Said he: "The autocorrelation function was chosen as a tool, because autocorrelation analysis is preferable to the periodogram technique or to Fourier analysis for investigating the possibility of prediction."¹

He found a ten-year market period but said:

The uncertainty regarding the axis, together with the masking effect of the superimposed noise, also almost completely rules out the possibility of a qualitative estimate of the future trend of the market. Finally . . . even if prediction of the stock market by Wiener's method were possible, the result would be purely statistical; that is, it would be the center of a probability distribution. An occasional large deviation would occur and, inasmuch as no period shorter than 10 years is present, opportunities for averaging out a loss due to such a deviation would be few and far between.²

An analysis of what subsequent market action follows prior market action was made by L. C. Wilcoxon. Beginning with the assumption that the amplitude of the subsequent market movement may be expected to bear some relation to the amplitude of prior movement, he studied the price changes in United States Steel common stock from 1922 to 1932. He divided the period into a number of different intervals beginning with 1-1, that is a one-day-prior interval with its subsequent one-day interval. Others were 2-2, 4-4, 8-8, 16-16, 32-32, 48-52, and 64-52.

Next the percentage change for each of the 2,900 market one-day

²Ibid., p. 153.
intervals was determined. From these a series of frequency charts were made for successive brackets of percentage change from the prior day. From the frequency charts the probable error was computed and used as the forecasting criterion.

The system was tested by hypothetical trading over the period of 1918 to 1940. The conclusion:

1. The internal probability method of analysis of market action demonstrates there are no well defined cycles in U. S. Steel common stock.

2. Forecasts of U. S. Steel common stock based on the probability curves of intervals up to the 32-32 day intervals all yield net profits in various amounts.

3. Maximum profits are obtainable when the forecasts are based upon the action of the market over an interval of about 32 market days.

4. Even the best interval probability forecasting results are so erratic from year to year, that the usefulness of this method of market forecasting is seriously impaired.

Graphical. In general most charts used in studying the market are used to graphically indicate the phase of the cycle the market, or an individual stock, happens to be in at the time. Owing to the fact that the greatest use of charts seems to be to forecast the movement of individual stocks, their main discussion will be in the following chapter.

In his study of cycles, Charles Young of the Securities Cycle

Research Corporation, uses a number of ratios expressed graphically to determine the various phases of the cycle.¹

The main problems that he indicates are: how to identify major cycle tops in order to liquidate cyclical stocks before a main down-swing, how to stay with the main growth issues throughout their full swing of appreciation, and how to know when it is safe to buy again during dips or shakeouts in each kind of cycle swing.

To solve this problem he constructs a number of charts. One index shows the total weekly advances in per cent of total weekly advances and declines. This is a One Week Wave and can only be read going with the trend. In an uptrend it will give "buy" signals when it rises sharply above the 50 per cent line and, in a main downtrend, "sell" signals when it goes above.

A One Year Wave is a 52-week moving average of the One Week Wave's basic figures. When it goes above the 58 per cent line it is a sell signal.

A Three Quarters Wave is a moving average of the same basic figures. In a strong bull market its sell signal is given when it reaches 63 per cent.

After a general market decline these two longer wave indexes taken with the shorter ones are helpful in indicating major turning points or "buy levels" when all of the indexes together go substantially

below the 50 per cent line. A follower would miss from one-half to
two-thirds. This will conclude the discussion of cycles; however, it may
well be asked whether the notion of an average amplitude or duration
has any meaning over a short period, or at the other extreme over a
long period which stretches back into the days when most of the securi-
ties now dealt in did not exist. To proclaim the existence of a market
cycle may mean no more than a learned way of saying that prices never
stay steady for long. They are unlikely to fall below a minimum if
there is any industrial activity whatever, and also unlikely to rise
infinitely high. That does not in the least detract from the importance
of trying to estimate those limits, and to judge when they will be
reached, but we may become inclined to see regularity and rhythm where
none existed and the oscillator was developed. The Bonnard speeds
up the signals a little and is believed to be successful in keeping one
on the right side of the trend about seventy-five per cent of the time.

III. SUMMARY

Following the trend and anticipating the trend are the two logi-
cal divisions of internal analysis. Long observation of the market has
revealed that most stocks go up together, on a rising trend, and most
go down together on a falling trend; therefore, if an investor can
successfully follow a rising trend, his stocks should appreciate in
price. The notion of purchasing stocks without an investor having to
think. The Dow theory was effective in following the trend because it
would enable a follower to get in the market on a rising trend and out
of it on a falling trend. It was inadequate because its method of
signaling was always late and followers would miss from one-half to two-thirds of the rise. In addition the rails only account for about ten per cent of the market now and are not believed necessary to confirm any action of the industrials.

Samuel Moment attempted to inject some refinements into the Dow theory which would eliminate any controversial indications. He was somewhat more successful in following the trend but would still miss a large part of the rise.

Moving averages have been employed to identify the minor, intermediate, and major trends. They are successful in keeping an investor on the right side of the trend; however, the signals which they give will always be late also. In an attempt to eliminate the late signals the Semaphore and the Oscillator were developed. The Semaphore speeds up the signals a little and is believed to be successful in keeping one on the right side of the trend about seventy-five per cent of the time. The Oscillator is believed to be quite accurate in signaling turning points of the trends; however, few people can keep an hourly chart up-to-date.

Other trend-following methods included the ten per cent and the eleven per cent rules. These were additional attempts to find some automatic method of purchasing stocks without an investor having to think. They will work part of the time, but a follower will frequently be "whipsawed" with false signals and use up any profits in the cost of trading.
All of these methods have limited value because their signals will always be late. There must be a substantial change in the trend before it can be recognized.

Price, volume, and trading ratios, cycle analysis, and breadth of the market data all attempt to anticipate the trend.

Price ratios have not been particularly successful in anticipating turning points of the market; however, once the direction of the trend has been established, they can show what group of stocks is doing better than the market, as a whole, and narrow the choice of stocks to that group.

Volume of shares traded should be observed to indicate peaks of speculative interest, but it is not consistently related to price changes. The trading ratios such as odd-lot and short-sales are both relatively small fractions of the total trading and no group of investors is so consistently wrong as to allow dependable forecasts to be based on their actions.

A great deal of work remains to be done yet in the field of cycle analysis before it can be of much value to the investor. Even so, it should warn one that few stocks will continue to increase in price indefinitely; therefore, after a prolonged rise, one might be wise to take any accumulated profits and switch to something that is counter-cyclical or else hold cash for a period of time.

The breadth of the market studies seem to get into the heart of the problem of anticipating turning points of the trend. Even
though a variety of methods have been attempted, the ratios of new highs and new lows, to the total issues traded, and the ratios of advances and declines, to the total issues traded, seemed to have worked the best. One may hazard the guess, though, that they do not work all of the time because if they did there would be no reason to develop all of the other methods which came later.

This leaves the problem of anticipating turning points in the market still unsolved. The best that has been done is to recognize the market's trend, early, isolate the group or groups which are doing better than the market as a whole and then face the problem of selecting the stock or stocks doing better than the group.

Answers to that problem will be attempted in the next chapter.

CHAPTER V

INTERNAL METHODS FOR DEALING WITH INDIVIDUAL STOCKS

In the previous section the principal methods used to follow the market's trend were discussed. Even though it might be possible to accurately predict the trend or develop a successful method for following it, once it had been established, the biggest problem remains unsolved. That problem is what particular stocks to buy. It has been said many times that one cannot buy or sell the averages.

At no time do all of the stocks go up together or all go down together. Any day, selected at random, will show some stocks making new highs for the year and some making new lows. Some will have advanced and some will have declined. Even in the big bull market of 1924 to 1929 some stocks went on and reached new all-time highs in 1930 after the market crash of 1929. In the summer of 1959 after the big market drop from early in August to the middle of September, American Motors and Studebaker-Packard went on making all-time highs while the majority of other stocks declined seriously.

As an aid to dealing with this most important problem, a number of procedures are employed. Charts, of various types, are probably the leading tools of the technical analyst. There are a number of types, possibly the most important of which is the chart that keeps track of the daily high and low range of the stock and the volume of shares traded.

types; possibly the most important are those that keep track of the daily price range of the stock and the volume of shares traded and the time period during which the transactions occurred. The point and figure technique of charting ignores the volume of shares traded and, for all practical purposes, the time element. Ratios are also prepared to assist in selection of individual stocks and there are a great many other types of trend methods, deviations, and gadgets used to prognosticate the market.

Perhaps one of the most interesting methods is that of tape reading. The true tape reader supposedly ignores everything else in making his selection of stock except the information which comes in directly over the ticker tape. Obviously few people have the time or inclination to sit watching the ticker tape for long hours and they cannot afford to trade in the large blocks of stock necessary to make a profit on a fraction of a point change. An attempt was made to test some of these methods to see if they would have been of any help to an investor or stock trader during the preceding year.

I. VERTICAL LINE CHARTS

Technical market analysis maintains that graphs of the fluctuations of security prices, reflecting the decisions of millions of investors, afford the most tangible clues to future price movements.
confidence, caution, or doubt, are revealed in the forms and patterns of these movements. In the days before the Securities Exchange Commission charts were found to be of great use in detecting pools and various other types of manipulation. This would enable the chartist to take advantage of the situation. Now that the regulation has prevented all pools and other types of manipulation chartists have turned their efforts to other types of formations.¹

Perhaps the most widely used type of chart is the vertical line. They keep track of the high, low, and closing price of a stock for a definite time period. This could be daily, weekly, monthly, or even yearly. Most, also, keep track of the number of shares traded over that time period. This is used to confirm the price patterns. Others also keep a ratio of that stock, or its group, to the Dow Jones industrial average, or some other average, in order to tell at a glance whether the stock or its group is doing better or worse than the market as a whole.

The mechanics of chart construction is simple enough. Graph paper with either arithmetic or a semi-logarithmic scale can be used. The horizontal scale is time and the vertical represents price changes. In the case of the arithmetic scale, equal distances on the vertical

scale represent equal amounts in dollars, whereas on the semi-logarithmic paper they represent equal percentage changes. Much can be said for using either type of chart.

Above the proper date or time period, a vertical line is drawn to mark the high and low price which the stock reached for that period, in accordance with the vertical scale. A small tic on the side of the line indicates its closing price. Any time period can be used, but for actual trading purposes generally daily or weekly charts are used.¹

As time goes on various patterns emerge on these charts; while some are quite obvious, others seem to require a great deal of imagination to detect. Many of them are believed to indicate future movements of the stock.

Schabacker identified some fourteen of them and discussed their importance in trading.² Since that time a great deal of additional work and study has been devoted to this. Possibly the best-known practitioner of this method of charting is John Magee. In his scholarly book some thirty types of chart patterns have been identified and their significance covered.³

Figure 7, page 126, Figure 8, page 134, and Figure 9, page 142, illustrate these formations, generally in a much more idealized fashion

¹Edwards and Magee, op. cit., pp. 308-313.
²Schabacker, op. cit., pp. 600-621.
³Edwards and Magee, op. cit., pp. 46-270.
Figure 7. Vertical line chart reversal patterns. (Based on illustrations in Edwards and Magee, Technical Analysis of Stock Trends. Springfield, Mass.: John Magee, 1969)
than they ever appear on any charts. In the pages following, each of these formations is discussed and their importance in trading indicated, in accordance with the general principles outlined by Edwards and Magee in their book.

Reversal Patterns

It has already been established that stock prices move in trends. Some of those trends are straight, some are curved; some are brief and some are long-continued; some are irregular or poorly defined and others are amazingly regular. Sooner or later, these trends change direction. When they do, in most cases, a characteristic pattern takes shape on the chart and becomes recognizable as a reversal formation. The reason is that once a trend has been established in stock prices it takes time to slow down and change direction. Therefore the first and most important task of the technical chart analyst is to learn to know the important reversal formations and to judge what they may signify in terms of trading opportunities.

**Head-and-shoulders top.** The head-and-shoulders top is one of the best known and respected formations used by chart readers. It is a very important reversal pattern and indicates the end of an upward movement in stock prices. As the curve forms the right shoulder, it fails to recover as high as the head and then turns down again. When the curve penetrates the neckline after forming the right shoulder, this confirmation or breakout is supposed to be a definite indication
of a downward movement. This basic reversal formation is believed to give an indication as to the extent, in points, of the move which is likely to follow the completion of a head-and-shoulders. Measure the number of points down vertically from the top of the head to the neckline as drawn on the chart. Then measure the same distance down from the neckline at the point where prices finally penetrated it following the completion of the right shoulder. The price level then marked is the minimum probable price and should be tested frequently in the course of additional price-objective of the decline.

Head-and-shoulders bottom. The head-and-shoulders bottom is the exact reverse of the head-and-shoulders top; it allegedly indicates the reversal of a downward trend and it is, therefore, a bullish signal. It is essential that the relative volume of trading must increase to confirm a breakout through the neckline of a head-and-shoulders bottom. The measuring implications of the head-and-shoulders bottom are the same in all respects and are applied in the same way as with tops.

Multiple head-and-shoulders patterns. The multiple head-and-shoulders patterns are also known as complex formations and are merely head-and-shoulder reversals in which either the shoulders or the head, or both, have been doubled or proliferated into several distinct waves.

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1Ibid., pp. 50-58.  
2Ibid., pp. 58-61.  
3Ibid., pp. 64-67.  
4Ibid., p. 67.
Almost any combination is possible and the same general rules about
penetrating the neckline to indicate a change in the trend apply. 1

Rounding tops and bottoms. The rounding turn pictures simply
and plainly a gradual, progressive and fairly symmetrical change in
the trend direction, produced by a gradual shift in the balance of
power between buying and selling.

Tops of the rounding type are very rare in the lower and medium
price ranges, but appear frequently in the charts of high-grade pre-
ferred stocks because the demand for these reflects chiefly two factors:
supply of funds seeking conservative investment and interest rates,
both of which tend to change very slowly. The speculative appeal which
produces wide-swinging price fluctuations is absent in such issues.

The same line of reasoning explains why rounding tops almost never
develop in lower priced, speculative common stocks; bull markets in
those are topped off by excited public buying which pays little or no
heed to long-range investment considerations. 2

Dormant bottoms. The dormant bottom is an extreme development
of the "extended flat-bottomed form" of rounding bottom. It appears
characteristically in stocks whose floating supply is very small. In
such issues a normal day's turnover may be only two or three hundred
shares in an active rising market. After a severe sell-off, some days
sawing up without a moment's warming as though a cold spring had been

1Ibid., pp. 67-72. 2Ibid., pp. 75-79.
may appear with no trading at all. Weeks and months may go by with little activity. Eventually there may appear a sudden and usually quite inexplicable flurry of activity. This "break out of dormancy" can be a premature move, to be followed by several more weeks of inactivity, or it can be the first lift in a sort of step-up process with shorter and shorter intervals between each step until finally a consistent uptrend develops.\(^1\)

\(^1\) Some break in prices may be confirmed by a marked increase in trading volume.

**Symmetrical triangle.** The symmetrical triangle is the commonest and most reliable chart pattern confirming by a break-up in activity a form of triangle. It is composed of a series of price fluctuations, each of which is smaller than its predecessor, each minor top failing to attain the height of the preceding rally and each minor recession stopping above the level of the preceding bottom. The result is a sort of contracting "Dow line" on the chart or a sidewise price area or trading range whose top can be more or less accurately defined by a down-slanting boundary line and whose bottom can be similarly bounded by an up-slanting line. This is also known as a coil or a spiral formation. There must be four reversals of minor trend before it is safe to conclude a symmetrical triangle is building.

The wide fluctuations at the left of the formation are eventually compressed as buying and selling dies out. Then, if this is a typical example, comes the action which first suggested the name "coil." For suddenly and without warning as though a coil spring had been wound

\(^1\)Ibid., pp. 81-82.
tighter and tighter and then snapped free, prices break out of their triangle with a notable pick-up in volume, and leap away in a strong move which tends to approximate in extent the up or down move which preceded its formation.

There is seldom any clue given on the chart containing the triangle to tell in which direction the prices are going to break out of pattern, until that reaction finally occurs. An *upside* break in prices must be confirmed by a marked increase in trading volume. A downs-ide breakout does not require confirmation by a pick-up in activity.¹

Symmetrical triangles are subject to false moves to a far greater extent than the head-and-shoulder formations or any of the others.²

The term "false move" indicates that a formation is not acting according to theory; the phrase is a favorite alibi of the chart follower for explaining unorthodox moves of any given formation.

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¹Ibid., pp. 87-92.  
²Ibid., p. 93.
ascending type. If the bottom line is horizontal and the top line slopes down, the triangle is *descending*. The ascending is the bullish manifestation and the descending is the bearish manifestation of the symmetrical triangles.¹

Like the head-and-shoulders measuring formula, one is used for triangles to give an indication of future movements. It applies to both the symmetrical and right-angle species. Assuming that one is dealing with an up movement, or an upside breakout, draw from the top of the first rally which initiated the pattern, or in other words, from its upper left-hand corner a line parallel to the bottom boundary. This line will slope up away from the pattern to the right. Prices may be expected to climb until they reach this line. Also, as a rule, they will climb, following their breakout from the pattern, at about the same angle or rate as characterized their trend prior to their entering the pattern. This principle permits the chartist to arrive at an approximate time and level for them to attain the measuring line. The same rules apply, but measuring down from the lower left corner, to a descending move.

Although application of this formula does afford a fair estimate of the extent of move to be expected from a triangle, it is neither as definite nor as reliable as the head-and-shoulder formula.²

Rectangles. A rectangle consists of a series of sidewise price

¹Ibid., pp. 102-111. ²Ibid., pp. 111-115.
fluctuations which can be bounded both top and bottom by horizontal lines. Such a formation is supposed to indicate an area of conflict between buying and selling forces; they are in equilibrium and of relatively equal strength. Any downward movement of prices is met by vigorous buying support at the lower resistance level; any upward movement is met with selling pressure at the upper resistance level. Eventually, one side of the market becomes exhausted and a breakout occurs; the stock is then ready to resume either an upward or a downward trend. Once this trend is indicated, it is believed to be very reliable. 

A safe minimum measuring formula for the rectangle is given by its width. Prices should go at least as far in points beyond the pattern as the difference in points between the top and bottom lines of the pattern itself.

Double and triple tops and bottoms. Double and triple tops differ only in the number of tops. The principle is the same in both formations. The formation indicates a resistance level above which a stock will not penetrate. When the stock reaches that level, distribution is supposed to take place and it is thrown on the market by sellers who believed it to be overpriced. The double and triple tops, therefore, are signs of weakness in a stock.

Double and triple bottoms are the reverse of tops; they are signs of strength. When the stock reaches the bottom, accumulation by "strong

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1 Ibid., pp. 117-125.  
2 Ibid., p. 125.  
3 Ibid., pp. 128-139.
Figure 8. Additional reversal patterns, intermediate trend, and consolidation formations. (Based on illustrations in Edwards and Magee, Technical Analysis of Stock Trends, Springfield, Mass.: John Magee, 1959)
hands" is believed to begin; the stock has met a resistance level. If the stock should penetrate the double and triple bottom, that would indicate a new sign of weakness.\(^1\)

Fully confirmed double tops seldom appear at turns in the intermediate trend; they are characteristically a primary reversal phenomenon. Thus if prices on their recession from the second peak drop through the bottom level of the valley a reversal of trend from up to down is signaled and it is usually of major importance.

As to measuring implications, the double top affords no formula comparable with what has been attributed to the head-and-shoulder and triangle formations, but it is believed that the decline will continue at least as far below the valley level as the distance from peak to valley.\(^2\)

Broadening formation. These are sometimes referred to as "inverted triangles" because, starting with very narrow fluctuations, they widen out between diverging rather than converging boundary lines. These are generally regarded as very risky formations and carry bearish implications. The reason is that, even though the patterns may be roughly marked off with two diverging lines, the rallies and declines usually do not all stop at clearly marked boundary lines. Therefore the breakouts are difficult to determine.\(^3\)

Right-angled broadening formations. When a broadening formation

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\(^1\)Ibid., pp. 134-139.  \(^2\)Ibid., pp. 132-133.  \(^3\)Ibid., pp. 140-148.
has a horizontal top or bottom it is called a right-angled formation. Generally speaking, it is regarded as being a bearish formation regardless as to which side is horizontal.

The horizontal side is believed to indicate either accumulation or distribution, at a fixed price, depending on which side is horizontal and it follows, logically, that any decisive break through that horizontal side has immediate forceful significance. Thus, if a broadening price pattern with a flat top boundary develops after a good advance and if prices finally burst up through that top line on high volume and close above it to a conclusive extent, then it is believed that the preceding uptrend will be resumed and carried on for a worth-while move. This does happen, although it is rare. Generally the opposite happens and the forces of distribution win out causing an extensive decline.¹

The diamond. This might best be described as a broadening formation which, after two or three "swings," suddenly reverts into a regular triangle which is nearly always of the symmetrical form. This is not a common pattern and since its development requires fairly active markets, it rarely occurs at bottom reversals.²

It carries a minimum measuring implication in that prices should move at least as far from the breakout point as the greatest width in points of the pattern from its top to bottom.³

Intermediate Trend Formations

All of the chart formations thus far can and do develop at changes in the major trend of prices. A few of them seldom occur at any other than a major reversal. The next three patterns are ordinarily minor or at most are only intermediate in their trend implications. Nevertheless they are believed to be useful in trading operations.

Wedge formations. The wedge is a chart formation in which the price fluctuations are confined within converging straight, or practically straight, lines but differing from a triangle in that both boundary lines either slope up or slope down. When the wedge formation points up, it is called a rising wedge. This typifies a situation which is growing progressively weaker in the technical sense, thus it is bearish. Once prices break out of the wedge down-side they usually decline quite rapidly.

Except for the fact that it is pointed down, the falling wedge appears in all respects like the rising form. But the price trend which follows its completion differs in character. When prices move out of a falling wedge they are more apt to drift sidewise before they begin to rise.1

The one-day reversal. This situation occurs on a day of unusually high volume, exceeding as a rule by a notable margin any trading turnover

1 Ibid., pp. 155-159.
registered in any one market session for several months past. It comes after a fairly long and steady advance, or a similar decline, on which activity has been increasing gradually. Prices open very strong and shoot up fast, then suddenly the trend reverses and prices move just as rapidly in the opposite direction. The session ends with a final burst of activity which puts the price at the close right back where it started the day.

This phenomenon occurs frequently within or at the start of more important technical formations and it is believed to give an important clue to probable trend developments.¹

Selling climax. The selling climax comes after a decline approaching panic proportions. The day usually opens substantially lower than the previous night's closing; offerings appear too great to be absorbed; prices collapse; the tape runs late; the market is exceptionally "broad" with nearly every listed stock crowding into the record. Generally the trend reverses rapidly; therefore a trader must take his profits quickly in order to take advantage of buying low during a selling climax.²

Consolidation Formations

When a stock pushes ahead, either up or down, too fast, it reaches a point where the forces that produced its move are exhausted. Then it either reverses its trend, reacts to a good support level, or

¹Ibid., pp. 169-162.
²Ibid., pp. 162-167.
consolidates its position, in some sort of "sidewise" chart patterns composed of minor fluctuations, until it is ready to go on again.

Two of the formations previously referred to are consolidation formations as well as reversal formations. They were the symmetrical triangles and the rectangles. They could either reverse the trend or consolidate it in preparation for its continuation.

Almost any sort of sidewise price action, such as is often termed a "congestion" or trading area, usually functions as a consolidation. But most areas of trend consolidation are fairly well defined; they take on a recognizable pattern.

Flags. A flag resembles a flag on the chart. It is a small, compact parallelogram of price fluctuations, or tilted rectangle, which slopes back moderately against the prevailing trend. It usually forms after a rapid and fairly extensive advance which produces a nearly vertical, or at least quite steep, price track on the charts. On successive rallies the previous peak is not quite reached. Thus on the chart the initial, steep upmove followed by the compact, sidewise and slightly down-sloping price congestion area, which can be roughly bounded, top and bottom, by parallel lines, takes on the appearance of a mast with a flag flying from its peak.¹

The pennant. The only important difference between a pennant

¹Ibid., pp. 168-173.
and a flag is that the former is bounded by converging boundary lines rather than parallel.¹

The same approximate measuring formula applies to the pennant as to the flag. One measures from the immediately preceding move where the stock broke away from a previous consolidation or reversal formation to the minor reversal level at which the flag or pennant started to form. Then measure the same distance from the point where prices break out of the flag or pennant, and in the same direction. The level thus arrived at is the minimum expectation of this type of consolidation pattern.²

These patterns of consolidation are regarded as among the most dependable of chart formations, both as to direction and measuring implications.

Gaps on daily charts are produced when the lowest price at which a certain stock is traded on any one day is higher than the highest price at which it was traded on the preceding day, or when the highest price of one day is lower than the lowest price of the preceding day. When the ranges of any two such days are plotted, they will not overlap or touch the same horizontal level on the chart. There will be a price gap between them. For a gap to develop on a weekly chart it is necessary that the lowest price recorded at any time in one week be higher than

¹Ibid., pp. 174-175. ²Ibid., p. 177.
the highest price recorded during any day of the preceding week.

From the earliest days of charting, gaps attracted attention. These "holes" in the price trend graph were conspicuous. For purposes of this study, they may be divided into four classes: common or area gaps, breakout gaps, continuation or runaway gaps, and exhaustion gaps.¹

**Common or area gaps.** This type of gap gets its name from its tendency to occur within a trading area or price congestion pattern. Such pattern gaps are usually "closed" within a few days. This means that the subsequent price trend comes back and retraces the range of the gap.

The forecasting significance of common or pattern gaps is practically nil. They have some use to the technician simply because they help him recognize an area pattern; that is, their appearance implies that a congestion formation is in process of construction.

Pattern gaps are more apt to develop in consolidation than in reversal formations. Thus the appearance of many gaps within an evolving rectangle or symmetrical triangle reinforces the normal expectation that the pattern in question will turn out to be a consolidation rather than a reversal area.²

**Breakout gaps.** The breakout type of gap also appears in connection with a price congestion formation, but it develops at the completion of the congestion pattern. Such gaps are often preceded by periods of congestion and are usually followed by a continuation of the trend in the direction of the breakout.

¹Ibid., p. 192. ²Ibid., pp. 192-194.
"A" Common Gap, "B" Breakout Gap

Continuation or Runaway Gaps

Exhaustion Gap

Island Reversal

Support-Resistance Levels

Trendline and Channel

Figure 9. Gaps, support and resistance levels, trendlines and channels found in vertical line charts. (Based on illustrations in Edwards and Magee, Technical Analysis of Stock Trends. Springfield, Mass.: John Magee, 1959)
of the formation in the move which breaks prices away. Their forecasting value is twofold. First, they serve to call attention to and emphasize the fact of a breakout. Second, they carry the suggestion that the buying demand, or selling pressure, that produced the gap is stronger than would be indicated by a gap-less breakout. Hence, it may be inferred that the ensuing move will carry prices farther or faster, or both, or at the time when the runaway is at its height, when quotations. Except for that presumption of somewhat greater "steam" behind the move, the breakout gap carries no particular measuring implication, nor any other forecasting significance.¹

Continuation or runaway gaps. Though less frequent in their appearance than either of the two forms already discussed, runaway gaps are of far greater technical significance because they afford a rough indication of the probable extent of the move in which they occur. Both the common or pattern gap and the breakout gap develop in association with price formation of the area or congestion type, the former within the formation and the latter as prices move out of it.

The runaway gap, as well as the exhaustion gap which will be covered next, are not associated with area patterns but occur in the course of rapid, straight-line advances or declines. When a dynamic move starts from an area of accumulation, the upward trend of prices will seem often to gather "steam," to accelerate as

¹Ibid., pp. 194-198.
for a few days, and then begin to lose momentum as supply increases when the very extent of the advance invites more and more profit taking. Trading volume jumps to a peak on the initial breakout, tapers off somewhat in the middle of the advance, and then leaps up again to a terrific turnover as the move is finally halted. In such moves, and in rapid declines of corresponding character, a wide gap is quite likely to appear at the time when the runaway is at its height, when quotations are moving most rapidly and easily with relation to the volume of transactions. That period comes normally at just about the halfway point between the breakout which inaugurated the move and the reversal day or congestion pattern which calls an end to it. Hence, a continuation or runaway gap affords an approximate measurement of the move in which it develops. Its inference is that prices will go as much farther beyond the gap as they already had gone between the beginning of the move and the gap, as measured directly, and vertically, on the chart.\textsuperscript{1}

**Exhaustion gaps.** The breakout gap signalizes the start of a move; the runaway gap marks its rapid continuation at or near its halfway point; the exhaustion gap comes at the end. They are associated with rapid, extensive advances or declines.

Runaway gaps were described as the sort that occur in the midst of a move that accelerates to high velocity, then slows down again and finally stops as increasing resistance overcomes its momentum. Sometimes,

\textsuperscript{1}\textit{Ibid.}, pp. 198-202.
however, "skyrocket" trends evidence no such gradual increase of resistance as they proceed, show no tendency to lose momentum, but rather continue to speed up until suddenly they hit a stone wall of supply or, in the case of a decline, demand, and are brought to an abrupt end by a day of enormous trading volume. In such moves a wide gap may appear at the very end, i.e., between the next to the last and the last day of the move. This gets the name of exhaustion gap because the trend seems thereby to have exhausted itself in one final leaping spurt.

An exhaustion gap, taken by itself, should not be read as a sign of major reversal, nor even necessarily of reversal at all. It calls an approximate period of resistance to an end, in the process of terminating the trend development which may, in turn, lead to either reversal or continuation of the move prior to the gap.¹

Miscellaneous Formations

The island reversal. The island pattern is not common and it is not in itself of major significance, in the sense of denoting a long-term top or bottom, but it does as a rule send prices back for a complete retracement of the minor move which preceded it.

An island reversal might be described as a compact trading range separated from the move which led to it by an exhaustion gap, and from the move in the opposite direction which follows it by a breakout gap. The trading range may consist of only a single day, in which event

¹Ibid., pp. 202-205.
it normally develops as a one-day reversal, or it may be made up of rich from several days to a week or so of minor fluctuations within a compact price zone. The gaps at either end occur at approximately the same price level so that the whole area stands out as an island on the chart, isolated by the gaps from the rest of the price path.

Islands frequently develop within the larger patterns at turning points of primary or important intermediate consequences.\(^1\)

Support and resistance. Support may be defined as buying, actual or potential, sufficient in volume to halt a downtrend in prices for an appreciable period. Resistance is selling, actual or potential, sufficient in volume to satisfy all bids and hence stop prices from going higher for a time, brief or of long duration. They may be classified as following:

Thus a support level is a price level at which sufficient demand for a stock appears to halt a downtrend temporarily at least, and possibly reverse it and start prices moving up again. A resistance zone, by the same token, is a price level at which sufficient supply of stock is forthcoming to stop, and possibly turn back, its uptrend.\(^2\)

Therefore the top boundary of a horizontal congestion pattern such as a rectangle is a resistance level and its bottom edge a support level. If possible, its outward reversal.

The basis for this theory is that turnover in any given issue tends to be concentrated at the several price levels where a large

\(^1\)Ibid., pp. 207-209. \(^2\)Ibid., p. 211.
number of shares changed hands in times past. Since any level at which a great volume of trading takes place usually becomes a reversal point in that stock's trend, it follows naturally that reversal levels tend to "repeat." But here is the important fact: these critical price levels constantly switch their roles from support to resistance and from resistance to support. A former top, once it has been surpassed, becomes a bottom zone in a subsequent downtrend; and an old bottom, once it has been penetrated, becomes a top zone in a later advancing phase.  

Trendlines. One of the basic tenets of technical analysis is that prices move in trends. These trends may be either up or down or sideways. They may be brief or of long duration. They may be classified as major, intermediate, or minor or as horizontal line formations. But sooner or later trends change; they may change by reversing from one type of trend to another. They may change from up to down or from down to up, and they may also change direction without reversing as, for example, from up to sideways and then perhaps to up again, or from a moderate slope to a steep slope, and vice versa. The investor's problem is to recognize a profitable trend at the earliest possible stage of its development and then later to detect, again as quickly as possible, its end and reversal.

One of the most obvious things on a stock chart is that nearly all minor and intermediate trends follow nearly straight lines. By

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1Tbid., pp. 212-216.
applying a ruler to a number of charted price trends it becomes apparent that the line which most often is nearly straight in an uptrend is a line connecting the lower extremes of the minor recessions within those trends. In other words, an advancing wave in the stock market is composed of a series of ripples and the bottoms of each of these ripples tend to form on, or very close to, an upward slanting straight line. The tops of the ripples are usually less even; sometimes they also can be defined by a straight line but more often they vary slightly in amplitude and so any line connecting their upper tips will be more or less crooked. On a descending price trend the line most likely to be straight is the one that connects the tops of the minor rallies within it, while the minor bottoms may or may not fall along a straight edge.

These two lines, the one that slants up along the successive wave bottoms within a broad up move and the one that slants down across successive wave tops within a broad down move, are the basic treadlines.¹

Sooner or later every trendline is broken. Some penetrations are only slight and have no significance. Therefore, the problem is to decide which breaks are of important technical significance and which are of no practical consequence. Unfortunately, there are no one hundred per cent certain, quick answers to this problem.

Trendlines serve two important functions: (1) when the trendline

¹Ibid., pp. 234-236.
is broken in decisive fashion it signals that the advance has run out; and (2) when a small top reversal pattern forms on the chart of an issue well up and away from that issue's intermediate up trendline, so that there apparently is room for the down-side implication of the reversal formation to be carried out before the trendline is violated, then the intermediate trend trader may well decide to ignore the small reversal patterns. He can hold on so long as the trendline holds.1

There are three general tests of authority used to determine the technical validity of a trendline: (1) The greater the number of bottoms that have developed at a trendline in the course of a series of minor up waves, the greater the importance of that line in the technical sense. Thus the action of the market can tend to confirm the trendline. (2) The length of the line is important. The longer it has held without being penetrated, down-side by prices, the greater its technical significance. (3) The angle of the trendline is also to some degree a criterion of its validity as a true delimiter of intermediate trend. A very steep line can easily be broken by a brief side-wise consolidation move.2

All of these appear to be the principal patterns employed by the technical analyst to enable him to forecast future stock price moves.

Testing of Vertical Line Charts

The writer was unable to locate any test of these patterns to

1Ibid., p. 239.  
2Ibid., pp. 240-241.
determine whether or not they actually work. In addition he was unable
to locate any quantity of charts prepared by one of the recognized
"experts" with the patterns indicated on them. This would enable anyone
to check the efficacy of the chart patterns merely by observing later action of the stock on the charts and seeing if the price either went up or down as it was supposed to according to the theory. Any really scientific test of these patterns would be far beyond the writer’s capability because of the time and expense involved in preparing the vast number of charts needed. As an alternative it was decided to take one hundred daily stock charts, covering a one-year period, and actually marking all of the various recognizable patterns on them.\(^1\) Any formations which were not fairly obvious and easily recognizable to anyone slightly familiar with this method of charting were not indicated. After this was done it was a simple process to observe the chart formations, apply any measuring indications supplied by the theory, and see if the future price action behaved as it was supposed to. For example, a total of six head-and-shoulders patterns were quite obvious and anyone could mark the neckline and almost a glance was all that was necessary to see if the break-through of the neckline carried at least as far below it as the top of the head was above it. Many of the other formations worked the same way.

\(^1\)One hundred Daily Stock Charts were secured from the Traders Research, Inc., Suite 375, Aronde Building, St. Louis, Missouri, for the period October 1958 through September 1959.
Table V, in the Appendix, contains the names of the stocks and the obvious formations and technical signs which were observed, for the period, on the charts. Lacking from the table are columns for any of the major bottom formations, since none were observed. This is not strange when it is remembered that the market was in almost a continuous and uninterrupted uptrend for the period and practically all of the stocks rose, to some degree, with the market. In addition, no diamond patterns were noted. Possibly none appeared or else the writer was not skilled enough to recognize them. It is said that they are rare and often difficult to identify; therefore, it was believed preferable not to find any rather than to include questionable patterns and attempt to arrive at conclusions regarding them.

Only a few major top formations were recognized. This also should not be considered strange because the market itself did not reach a major top for the period. It is true that it took a steep drop in late summer of 1959 but it climbed out of this and went higher later in the year.

Of the twenty-one types of technical formations and patterns observed, fourteen either carried some sort of measuring implication or were believed to be either bearish or bullish. These fourteen types were then carefully studied and, where called for, measurements taken of the future movements of the prices. Table II, on the following page, gives a summary of these measurements and observations. The cases in which the subsequent prices either rose or declined the minimum
### TABLE II

**SUMMARY OF PRICE ACTION FOLLOWING FORMATIONS FOUND IN 100 DAILY STOCK PRICE CHARTS**

<table>
<thead>
<tr>
<th>Formation Type</th>
<th>H&amp;S Top</th>
<th>R&amp;S Top</th>
<th>Double Top</th>
<th>Triple Top</th>
<th>Ascending Triangle</th>
<th>Descending Triangle</th>
<th>Broadening Formation</th>
<th>Rising Wedge</th>
<th>Falling Wedge</th>
<th>Flag</th>
<th>Pennant</th>
<th>Runaway Gap</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prices rose or declined according to theory</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>17</td>
<td>16</td>
<td>17</td>
<td>13</td>
<td>14</td>
<td>4</td>
<td>3</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>Smaller rise or decline than theory called for</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>4</td>
<td>8</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>False move—started in one direction, then reversed</td>
<td>2</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>6</td>
<td>3</td>
<td>6</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prices acted the opposite of theory</td>
<td>6</td>
<td>13</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No measuring implications, prices went up</td>
<td>10</td>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>No measuring implications, prices went down</td>
<td>11</td>
<td>3</td>
<td></td>
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<tr>
<td>Formation not completed, no breakout</td>
<td>2</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td>5</td>
<td>4</td>
<td>2</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total chart formations</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>23</td>
<td>29</td>
<td>26</td>
<td>28</td>
<td>32</td>
<td>15</td>
<td>25</td>
<td>21</td>
<td>4</td>
</tr>
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</table>
distance called for in the theory are recorded in the top line. A move in the right direction but not as high, or low, as the theory calls for was recorded in the next line. Any false moves were indicated in the third row. These would be the cases where prices broke out of the formation in one direction and later reversed itself quite rapidly. A trader using these charts would either have purchased stocks just before they started rapidly down or sold his stocks just before they went up. In either case a loss would have been suffered. The instances where the prices acted just the opposite of the theory were recorded in the line following. The broadening formations carry no specific implications, but are generally believed to be bearish. It was merely noted if the prices went up or down after the formation was completed. Even though some of the formations were complete at the end of the chart, the break-out hadn't occurred; therefore it was not possible to tell if the stocks acted favorably or unfavorably, as far as the theory was concerned, from the charts.

In addition to the broadening formations previously warned against, it would appear from Table II that the riskiest trading formations are the descending triangles and the rising wedges. The others it would seem could have been of some help in enabling a trader to make his commitments. Naturally with the extreme advantage of hindsight it is easy to make these observations. However some of them do appear to work fairly well. Some charts were prepared to illustrate some of the better examples of this type of chart formations and the instances.
where they have behaved correctly according to the theory.

Figure 13, in the Appendix, shows a very fine head-and-shoulders formation which appeared in the Dow Jones industrial averages during the summer of 1969. Previously it was pointed out that these chart examples are believed to apply not only to individual stocks but also to the entire market as well when it is charted with one of the stock averages. Therefore after the prices penetrated the neckline it was a bearish signal and the prices complied and dropped very rapidly.

Figure 14, in the Appendix, illustrates the classical type of broadening formation which also appeared in the Dow Jones industrial average and which turned out to be the predecessor of the steepest one-month drop in the market averages, in almost thirty years.

Figure 15, found in the Appendix, which is a chart of Allied Chemical, demonstrates how an ascending triangle broke out of its formation at 96 and went to 100, retraced its move, and then went on and formed a rectangle before continuing its rise to 132.

The chart of Central Foundry, Figure 16, located in the Appendix, contains a variety of interesting technical examples. It begins with an ascending triangle where the prices reached a resistance level at 12 3/8 on three separate occasions over a two-month period and finally on the fourth attempt the buying power won out and shortly ran the price up to 22. Also evidenced is a rising wedge from which the prices break out on the down side, shortly reverse and shoot up to form a flag, leaving a runaway gap along the way. The run-up is continued
from the flag via a breakout gap on up to an island reversal. From there prices drop into a symmetrical triangle with a breakout gap on the downside with the prices generally declining.

Eastern Airlines, Figure 17, in the Appendix, opens with a rectangle from which the prices emerge into a long rising wedge. The prices react properly, according to the theory, and turn down. However, they soon form into an ascending triangle which is supposed to be bullish. Unfortunately, in this instance, even though there was not sufficient room to illustrate it, prices penetrated the triangle on the downside and drifted lower. Thus this ascending triangle proved to be an unreliable indicator of future movements.

Any number of illustrations could have been prepared of stock charts and almost anything could be proven by them since the same formations seem to appear over and over again. It was believed that these examples would serve to illustrate this type of chart and how the signals are supposed to operate.

II. POINT AND FIGURE CHARTS

The other major type of charts employed by the stock trader or investor is the point and figure charts. These were developed many years ago and it does not appear that any particular individual is credited with this particular method of charting. A great deal of use is made of the point and figure method of charting in the commodity markets.
Earlier it was stated that price trends and market fluctuations result from the operation of supply and demand in the market. Point and figure analysis is directed toward the development of good market judgment in estimating the relative strength of supply and demand in individual stocks or commodities, to determine when to buy, when to sell, how much of a price movement is indicated, and how to appraise and limit risk.

The essence of the point and figure chart is the price reversal. Stock prices reverse continually, by eighths, quarters, full points, and more; and successive price reversals link up to make trend reversals. These reversals can be studied in as detailed or on as broad a scale as the chartist wishes. Most convenient for general detail work is the chart that plots price reversals of not less than one whole point and ignores fractions. The same chart may be used regardless of the unit of price change used, whether it be half-point or one-point, or a consolidation of several points.¹

¹A. H. Wheelan, Study Helps in Point and Figure Technique (New York: Morgan, Rogers and Roberts, Inc., 1957), pp. 6-9.
row of horizontal squares is darker. Thus the vertical price scale can conveniently be divided into units of 5, 10, 15, 20, and so forth, with the darker rows of squares indicating these divisions.

Entries, as called for, are plotted by the use of an "X" as a symbol being inserted in the proper square. This is purely a convention and has no intrinsic significance. Exceptions, such as the use of a month's initials to indicate the progress of time, and of zeroes and fives at price levels ending in these digits, merely facilitate reading the chart.

In charting a stock which advanced from 33 to 36, "Xs" are marked in the first column of squares beginning with 33, vertically on up the column to 36. In the 35 square a 5 is marked to indicate that a division ending in 5 has been reached. Now if the next move is up to 41, more "Xs" are marked in this same column on up to 41. When the square for 40 is reached, a zero is inserted instead of an X to make the chart easier to read.

So long as each price change continues in one direction, the recording remains in the same column. When a price change represents a reversal of direction, it is necessary to move to the next column to record the price change. The new column is needed because the square required is already occupied in the old column. When the new column contains only one entry it is a temporary condition; the next price change established the direction of that column and must be posted in that column.
As a result of this plotting method, the price development of a stock across a point and figure chart, from left to right, progresses only to the extent that price reversals take place. Unlike the vertical line charts of daily high-low-and-closing prices, the point and figure chart has no time scale at all. On a point and figure chart, lateral progress shows up graphically only when, in fact, successive price reversals occur. Thus two stocks, one of which reverses price direction more frequently than the other, produce very different charts. The differences which would have to be dug out of vertical line charts by a separate and time-consuming analysis show up instantly.

One of the most interesting features of point and figure analysis is the belief that they furnish the means for estimating how far a price movement is likely to carry by means of a vertical projection of a horizontal movement.¹

John W. Schulz, the point and figure expert for Forbes magazine, said:

Sustained uptrends and downtrends almost invariably begin and end in lateral trading ranges; and it can be taken as a general proposition that the lateral extent of price reversals in a trading range has a direct bearing on the carrying power of the uptrend or downtrend that ensues when the trading range is finally resolved.

This central fact makes possible one of the working hypotheses of P & F analysis: that an uptrend or downtrend can (not will or must) extend for as many units vertically on the chart as can be counted across in the trading range movement that precedes it.²

¹ Ibid., p. 15.
Other point and figure analysts take a much stronger attitude toward this principle. For example, A. H. Wheelan said:

There is a definite relationship between the lateral extent of a congestion area and the vertical extent of the ensuing price movement (either upside or down-side).

While there is nothing precise about this relationship, it will be found that the length of a congestion area will give an exact projection of the extent of the move in many instances.\(^1\)

One of the difficulties of point and figure analysis is that different "experts" can study the same chart and come up with very different interpretations. The matter of the "count" is a good example. This term means counting the squares across a congestion area to determine the approximate extent of the following move. The term "congestion area" means sidewise price activity within a trading range either as an interruption of a price trend or sidewise price action at the top or bottom of a trend.

In a study of point and figure technique by Fortune magazine they remarked:

It is perhaps worth noting that the patterns made by the X's can be construed differently by different point-and-figure experts. For example, when American Motors finally broke through its old "resistance level" of 43 in July, Walston's Edmund Tabell calculated that the next "objective" was 66 and called the stock a buy; Hayden, Stone's Kenneth Ward, looking at the same configuration, said the stock's near term potential was only 51 or 52.

It might be said in passing that before the year was out American Motors reached a high of 96 7/8.

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\(^1\) Wheelan, \(op. \ cit., \) p. 15.

If the main problem as to whether or not point and figure charts are any good can be ignored, momentarily, then the biggest problem among the point and figure chartists appears to be what data to use in constructing the charts. In the vertical line charts all of the data is published in the daily newspaper that is necessary to construct the charts. This is not so, however, with the point and figure charts. One Point and Figure Service which uses the text written by Staby as their authority seems to recommend the newspaper prices.\(^1\) Another Service, which uses a text by Alexander Wheelan, goes to great lengths to explain why newspaper data are not satisfactory in constructing point and figure charts.\(^2\)

From time to time we come across people who maintain their charts from the data that appear in the stock tables of the daily newspapers. We condemn this practice as being thoroughly unsound and unsatisfactory. . . .

. . . It is impossible to catch ALL of the price movements from the opening, high, low and closing prices as reported in the newspapers . . . .

Perhaps it doesn't seem too important to miss a fluctuation occasionally in posting the charts. But the cumulative effect of these lost price changes is very great. Over a period of time it will reduce the breadth of congestion areas so that count readings are rendered almost completely useless. . . .\(^3\)

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\(^1\)Chartcraft Review, Weekly Service, citing E. J. Staby, Chartcraft Method of Point and Figure Trading (New York: William-Frederick Press, 1949).

\(^2\)Morgan, Rogers and Roberts, Inc., citing A. H. Wheelan, Study Helps in Point and Figure Technique (New York: Morgan, Rogers and Roberts, Inc., 1957).

\(^3\)Wheelan, op. cit., p. 71.
This is no recent argument as evidenced by the writing of Schabacker more than twenty-five years ago. He was describing the advantages and disadvantages of the various types of charts and he pointed out that to construct figure charts it would be necessary to watch the ticker all day, or have the entire day's tape to analyze or else subscribe to a service which watches these intra-day changes and reports the material necessary to keep the chart up-to-date. He concluded by saying:

The latter is the only practical course for the average operator who insists upon the dubious necessity for having his figure charts absolutely exact. And the fees thus collected by the promoters of such "service" might well be suspected of providing at least an indirect incentive for their insistence upon the use of such methods. 1

This point may be well taken because one company charges $10.25 per month for one point daily changes of all of the stocks listed on the New York Stock Exchange. 2

The argument seems to have been carried over somewhat into the types of chart patterns regarded as buying and selling points by the two groups. Staby lists twelve patterns, six showing when demand is greater than supply and it is time to buy, and six showing supply greater than demand and indicating the time to sell. 3 Wheelan's book


2 Morgan, Rogers and Roberts, Inc., op. cit.

3 Staby, op. cit., p. 80.
lists eight of each type for a total of sixteen principal patterns in all.\(^1\) His patterns, to a certain extent, seem to come close to those employed in the line charts both as to name and appearance. Furthermore they appear to be more complex in appearance than those of Staby's. This could be the result of including all of the data pertaining to a stock's price transactions. It was not possible to determine which type of charting procedure works the best.

**Staby’s Chart Formations**

Figure 10 illustrates the six basic chart formations used to indicate "buy" points and the six used to indicate "sell" points.

The buy signals are: (1) triple top, (2) spread triple top, (3) spread triple top number 2, (4) bullish catapult, (5) bullish signal, and (6) bearish signal reversed. In the illustration of these patterns, "X's" are used when the price of a stock is going up and "O's" when the price is going down. The signal to buy is indicated by the letter "B."

The sell signals are just the reverse: (7) triple bottom, (8) spread triple bottom, (9) spread triple bottom number 2, (10) bearish catapult, (11) bearish signal, and (12) bullish signal reversed. In the illustrations the signal to sell is indicated by the letter "S."

**Triple top.** When a stock reaches the same high point for the

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\(^1\)Wheelan, *op. cit.*, pp. 24-26.
<table>
<thead>
<tr>
<th>Triple Top</th>
<th>Spread Triple Top</th>
<th>Spread Triple Top No. 2</th>
<th>Bullish Catapult</th>
<th>Bullish Signal</th>
<th>Bearish Signal Reversed</th>
</tr>
</thead>
</table>

| Triple Bottom | Spread Triple Bottom | Spread Triple Bottom No. 2 | Bearish Catapult | Bearish Signal | Bullish Signal Reversed |

Figure 10. Staby's point and figure chart formations; "B" is a Buy Point and "S" a Sell Point. (E. J. Staby, Chartcraft Method of Point and Figure Trading. New York: William-Frederick Press, 1949)
third consecutive time it forms a triple top. The more often this process is repeated the stronger becomes the formation. The time to buy is immediately after the resistance established by the previous tops has been overcome. If the time element exceeds two months then the formation is false. As a safety precaution it is recommended that one should avoid all triple tops completed at a higher price level than the best price reached in the previous year.\(^1\)

**Bullish catapult.** Sometimes after a stock has established a buying point it may be influenced by profit-taking in the market as a whole. Under these circumstances a reaction of from three to five points may result. When the uptrend is resumed and the stock advances one full point above the last previous rally, it is believed that another excellent opportunity for a quick profit is established. This is known technically as a catapult or a recoil formation.\(^2\)

**Bullish signal.** Four columns are required for this formation with each succeeding column starting one point above its preceding column. An ascending diagonal or trendline is formed. The buy point is established in the fourth column on the third point in the rise.\(^3\)

**Bearish signal reversed.** This is the reverse of the formation just described. The sell short point is established in the fourth column on the third point in the decline. When the descending diagonal

\(^1\text{Staby, op. cit., p. 23.}\)  \(^2\text{Ibid., p. 27.}\)  \(^3\text{Ibid., p. 29.}\)
or bearish trendline is intersected on the way up, a bearish signal reversed formation takes place. The buy point is established at one point above the intersection.1

Staby's selling patterns are just the reverse of these buying patterns; therefore the selling signals are just the opposite of the buying.

**Wheelan's Chart Formations**

Wheelan's chart formations are much more complex than Staby's as can be seen in the illustrations of them in Figures 11 and 12.

**Fulorum.** The fulorum is probably the most easily identified pattern and considered the most conclusive and significant. This is a base area of accumulation which occurs following a substantial price downtrend. It represents price activity adjustment to the lower price level in which buying power overcomes selling pressure in preparation for an advance to higher prices. The component parts of a fulorum are: (1) a price down thrust; (2) price activity near the bottom of the down thrust; then (3) a "mid-fulorum" rally of trading-range amplitude; followed by (4) a thorough testing of the low level of the fulorum; and, finally, (5) development of the "catapult" which means attaining a price one point (or one price-unit) higher than the top of the mid-fulorum rally.

1 Ibid., p. 33.
Figure 11. Wheelan's Point and figure chart formations, with Buy and Sell points darkened.
(A. H. Wheelan, Study Helps in Point and Figure Technique. New York: Morgan, Rogers and Roberts, Inc., 1957)
These are the ingredients to look for in a congestion area to determine if it has fulcrum characteristics.\(^1\)

The extent of the upmove that is promised by a fulcrum depends upon how extensive it is in width. Using the count across the breadth of the fulcrum is supposed to give a good approximation of how much of a price movement can be expected.\(^2\)

**The compound fulcrum.** The compound fulcrum is a formation which consists of a fulcrum followed by an advance at least to its minimum objective and, after topping action, a decline development of a second fulcrum. The sum total of the two fulcrums creating one large "compound" fulcrum. The buying levels in the compound fulcrum are at the following points with respect to the second component fulcrum: (1) at the area testing the level of the first down thrust, (2) at the penetration of a downtrend line established from the objective of the first component fulcrum to the mid-fulcrum rally point of the second component fulcrum, (3) at the catapult (or in the first dip following the catapult) out of the second component fulcrum. The first count objective is a measurement across the second component fulcrum; the longer range objective is a measurement across the entire compound fulcrum.\(^3\)

The delayed ending. The delayed ending is a type of bottom which occurs after a substantial downtrend. A congestion area builds

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\(^1\) Wheelan, op. cit., p. 21.  
\(^2\) Ibid.  
\(^3\) Ibid., p. 24.
up which may take on the appearance of a fulcrum or it may be simply a series of rallies and declines within the limits of a trading range. A moderate upside breakout is soon followed by a fairly substantial decline to a new low where the final elements of base development take place. The buying levels are: (1) on a decline testing the extreme bottom, (2) at the penetration of a trendline established from the highest point on the base prior to the "delayed ending" decline, and either plotted across the rally tops of the decline or made tangent with the mid-fulcrum rally peak, and (3) at the catapult point out of the "delayed ending" phase of the base. The first count objective is a measurement across this latter area while the longer range objective is a measurement across the entire base.¹

The inverse head-and-shoulders. The inverse head-and-shoulders is a base characterized by activity within a trading range, followed by a downside breakout and activity which in turn is followed by a recovery and further activity at the approximate price level of the original trading range and eventually an upside breakout. The three segments of this type of bottom are two congestion areas at about the same price level: one of which may be more extensive than the other, and joined by price activity at a moderately lower price level. The buying points are: (1) at the penetration of a downtrend line established from the last previous high to the top of the downside breakout

¹Ibid.
point of the first congestion area within the base, and (2) at the level representing the catapult from the last congestion area within the base. The first count objective is a measurement across the last congestion area of the base; the longer range objective is a measurement across the entire head-and-shoulders bottom.\(^1\)

**The V type base.** The V type of base is formed by the ending of a substantial downtrend followed by the start of an uptrend without any intervening sidewise or congestion area price action. If the bottom of the downtrend fulfills a previous downside count, then buying is believed justified on the penetration of a downtrend line plotted from the rally peaks within the downtrend. The upside count objective cannot be established until there is an upside breakout of a congestion area within the uptrend. The count is measured from this breakout, across the V pattern to the left side at the same price level on the way down.\(^2\)

**The V type extended base.** The V type extended base is formed by the ending of a substantial downtrend followed by the immediate start of an uptrend which carries far enough to penetrate a downtrend line plotted across the rally tops in the downtrend. Soon after breaking the downtrend, a substantial congestion area develops within a well-defined trading range which eventually is followed by an upside

\(^{1}\text{Ibid.}\) \(^{2}\text{Ibid.}\)
breakout. Buying is believed justified on the penetration of the down-trend line if the bottom of the downtrend fulfills a previous downside count. Further buying is in order on the breakout of the congestion area which developed at the top of the right side of the V. The count is measured from this breakout across the congestion area and the V, to the left side of the same price level on the way down.¹

**Duplex horizontal.** The duplex horizontal base consists of a substantial congestion area within a well-defined trading range followed by an upside breakout to a moderately higher level where another similar congestion area occurs. The buying levels in this type of base are at the breakout of the first and second congestion area or on the first dip following the breakout. The count objective is established by measuring the extent of the second congestion area; the longer range objective is arrived at by measuring across the two congestion areas from the bottom of the column in which occurred the upside breakout of the second.²

**Saucer.** The saucer bottom occurs toward the end of a substantial decline and is characterized by a gradual rounding-out action. As the development of this type of base progresses, it will form an arc, the tops and bottoms of which will follow an approximate parallel curve. The pattern may resemble a saucer sitting on its bottom or it may be

tilted diagonally with the left ridge higher than the right. The buying point is at the breakout of the top parallel curve or on the first dip following this breakout. Occasionally a downside breakout occurs as a terminal thrust before the upper curve is penetrated and this creates a dynamic pattern. The count objective is arrived at by measuring the arc across the entire bottom.\(^1\)

Market tops are made when the demand for an equity at a given price level is insufficient to absorb the available supply. The equity, therefore, is in a phase of distribution and lower prices are indicated. Chart patterns of distribution at tops bear a close inverse relationship to the patterns of accumulation in the bases or bottoms. For this reason, the comments with regard to the bottoms apply conversely to the tops.

**Testing of Point and Figure Analysis**

Point and figure charts are the most difficult and complex type used in following the stock market. There does not appear to be any standard text on the subject or even agreement on which particular figures should be used: newspaper figures or ticker tape figures. For these reasons the writer of this thesis did not believe that any point and figure charts constructed by him would adequately test the technique. Any conclusions from the charts would be subject to the serious question that the charts were improperly constructed. Therefore, to

\(^1\)Ibid.
avoid this situation, a study has been made of the results from charts constructed by two different point and figure "experts" in order to see how well their analysis measures up to subsequent market action. They are referred to as "experts" because one is a writer for Forbes magazine and has had a regular column on point and figure technique and the other is a chart service which charges their clients $72 per year for a weekly interpretation of the market according to the point and figure technique. The columnist appears to employ Wheelan's technique of using all of the figures from the tape and his chart patterns. The chart service uses Staby as their authority and even sends his text to their subscribers as a part of their service.

The columnist began writing in the issue of October 1, 1959. In the first eight issues, through January 1960, he has mentioned twelve different stocks which should be "prominent speculations" or in which "a rise to new highs is a distinct technical probability." At the last day of trading in January, the price of all twelve stocks was below the price at which they were recommended. Table III, page 174, shows the stock that was recommended, the price at the time, the issue date of the magazine, and the market price of the stock at the end of November 1959, December 1959, and January 1960.

Figure 18, in the Appendix, illustrates a point and figure chart, in units of five points of the Dow Jones industrial average which was

prepared by this same "expert" and appeared in the January 1, 1960, issue of Forbes. Undoubtedly this chart was prepared about the middle of December, since the averages were at 665 according to the chart.

TABLE III

STOCKS RECOMMENDED BY FORBES MAGAZINE POINT AND FIGURE COLUMNIST WITH PRICE AT ISSUE DATE AND SUBSEQUENT PRICES

<table>
<thead>
<tr>
<th>Date of magazine</th>
<th>Stock</th>
<th>Price at Issue</th>
<th>11-30</th>
<th>12-31</th>
<th>1-29</th>
</tr>
</thead>
<tbody>
<tr>
<td>10-15</td>
<td>Celanese, Sell @28-30 Buy @25</td>
<td>28 1/4</td>
<td>28 1/8</td>
<td>27 1/8</td>
<td>27 1/2</td>
</tr>
<tr>
<td>11-1</td>
<td>Glen Alden</td>
<td>24-25</td>
<td>25 7/8</td>
<td>23</td>
<td>19 1/8</td>
</tr>
<tr>
<td></td>
<td>National Theatres</td>
<td>11-12</td>
<td>13 1/2</td>
<td>12 1/2</td>
<td>10 1/4</td>
</tr>
<tr>
<td></td>
<td>Container Corp.</td>
<td>29</td>
<td>28 1/8</td>
<td>28 1/4</td>
<td>26 1/4</td>
</tr>
<tr>
<td>11-15</td>
<td>General Tire and Rubber</td>
<td>75</td>
<td>80 1/8</td>
<td>79</td>
<td>73 1/4</td>
</tr>
<tr>
<td></td>
<td>Diamond National</td>
<td>36-37</td>
<td>39</td>
<td>36 1/4</td>
<td>30 3/4</td>
</tr>
<tr>
<td>12-1</td>
<td>American Broadcasting Pmt.</td>
<td>31-32</td>
<td>32</td>
<td>28 7/8</td>
<td>28</td>
</tr>
<tr>
<td></td>
<td>Allegheny Common</td>
<td>13-14</td>
<td>13 3/4</td>
<td>12 1/2</td>
<td>11 1/2</td>
</tr>
<tr>
<td>12-15</td>
<td>Ashland Oil &amp; Refining</td>
<td>23</td>
<td>23</td>
<td>23 1/2</td>
<td>23 1/8</td>
</tr>
<tr>
<td></td>
<td>Cluett Peabody</td>
<td>57</td>
<td>56</td>
<td>62 1/4</td>
<td>52 1/2</td>
</tr>
<tr>
<td></td>
<td>Beckman Instruments</td>
<td>68 --</td>
<td>67 3/4</td>
<td>67 1/2</td>
<td></td>
</tr>
</tbody>
</table>

On it he has indicated that the market had two tentative targets of 675 at "R" and 690 at "G" in the near future. This was to demonstrate the effect of counting latterly and projecting it vertically to determine future moves. In addition, he said:

Assuming, for the sake of illustration, that the move to 680 (or higher) were to occur in the last column plotted on our chart, we can place a tentative target "H" (open circle) at 730. If more lateral action occurs before 680 is reached, target "H" could be raised accordingly.1

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Other places on the chart he indicated possible targets of 740 and, if that one were reached, 810 as a maximum.

Unfortunately for this expert, the market went straight on to 685 and on January 6, 1960, started the sharpest drop in almost thirty years, as measured by the Dow Jones industrial averages, down to 603. Apparently his point and figure analysis gave absolutely no indication of this impending drop.

The other "expert," the Chart Service, issues each week recommendations on several hundred stocks, indicating whether they should be bought or sold or if they merely have "bullish" or "bearish" tendencies with no definite chart signal indicated at the time of the report. Once a chart signal is indicated, it is in effect until a new signal countermands the old one.

In their issue of September 18, 1959, information about 432 stocks was given. In an effort to test how good the recommendations were, the first fifty stocks with "buy" signals, given since May 1959, were listed and the first fifty stocks with "sell" signals, since May 1959, were listed. Some had buy or sell signals going back several years and rather than having to be concerned with the problem of the validity of old signals, they were not included. The price at the time of the recommendation, September 18, 1959, was listed along with the prices on September 30, October 30, November 30, and December 31 for each of the stocks. This would give a fair test of the recommendation
against subsequent market action.¹

For purposes of this study a two point change was the minimum allowed as being satisfactory from a trader's standpoint since any less amount would be nearly used up in the cost of buying and selling the stock.

Table VI, located in the Appendix, shows the first fifty stocks which the Service suggested be sold and their future prices. By the end of September, only one stock had gone down more than two points and it only declined five and one-half. At the end of each of the next three months only four out of the fifty had declined in price, a total of fourteen and one-eighth points. If anyone had followed their recommendations and had sold his stocks or, worse yet, sold stocks short, the result would well have been disastrous.²

Their recommendations for buying stocks were better, as shown in Table VII, also in the Appendix. At the end of September, eleven out of the fifty had advanced a total of 39 1/8 points. By the end of October, twenty had advanced 152 1/2 points. November, nineteen advanced 215 5/8 points and December, twenty-four advanced a total of 222 1/2 points. On the surface, this appears to be pretty good, almost half of the stocks recommended advancing an average of nine points in


²Ibid.
three and one-half months. Closer examination shows that only seventeen increased more than 4 points and, of these, five stocks showed an increase of 107 1/8 points, or 48 per cent of the total increase. Only ten of the stocks increased a total of 157 7/8 points which was 70 per cent of the entire increase. 

Since the market as a whole advanced some 72 points, as measured by the Dow Jones industrial average, over this period, a system which produces only seventeen out of fifty stocks to show a gain of 4 points or more cannot be considered satisfactory by any set of standards. No test was made, but it might be interesting to draw fifty stocks at random, from the entire list of those traded on the New York Stock Exchange, and test them over the same period to see how they would compare.

In conclusion it must be said that this method of predicting the market is unnecessarily crude. It makes no attempt to observe what is going on structurally while the congestion areas are forming, and it ignores the valuable light thrown by volume changes and the time element.

III. MISCELLANEOUS METHODS

The decision to buy or sell a stock is very often heavily influenced by the price action of the issue in the recent past. In very
many cases this is the only factor given consideration. Nearly everyone is optimistic about a stock which has been enjoying a spirited advance, and nearly everyone is doubtful or pessimistic about an issue which has been in a prolonged downtrend.

The price trend itself inspires other buyers or sellers to act and, as a result, the move acquires a certain momentum. It has been established that a trend once started has a marked tendency to continue rather than reverse.

**Ratio analysis.** This momentum or inertia has given rise to a widely used method of stock selection which seeks to profit from merely riding the trend. The plan is to buy and hold only the stocks which are in an established uptrend and to sell those which are not. The belief is that the uptrend will continue long enough to make profitable a policy of simply following it along. When the trend reverses, then the idea is to sell promptly before a small decline becomes a big one.

This method has the supreme virtue of simplicity. It requires no involved studies of the position of the individual companies and no elaborate statistical comparisons. All that is required is to chart the price action of the individual stock and compare it with the action of the market. This is done by dividing the closing price of the stock each week by the price of the Dow Jones industrial average. This gives the ratio of the price trend of the individual stock to the trend of the market average. It is entered upon the chart as a solid line. When the solid line goes up, the stock is doing better than the average
and when it goes down the stock is doing poorer than average. Thus one should buy and hold only stocks with a better trend than the market.¹

This procedure can be used to determine which of the groups of stocks are doing better than the market as a whole and which stocks within the group are doing the best. This, then, would be one solution to the biggest of all market problems, namely, which stock to buy. It does an investor little good to determine that the market trend is up and then be unable to properly select a stock going with the trend.

**Tape reading.** As soon as a transaction is completed on the New York Stock Exchange, the essential details are flashed out simultaneously over the nearly 4,000 stock tickers which are in use. The information consists of a symbol, which represents the name of the stock traded, the number of shares involved in the transaction, and the price at which they were exchanged. From this meager bit of information, a small group of traders make all of their investment decisions. They are the tape readers. They participate in the most hazardous of all trading operations, that of attempting to catch the hourly or daily fluctuations of stock prices. These are sometimes referred to as "scalping" operations.

It is true that this is all of the information that technical analysis requires in making market decisions, yet tape reading and

¹Merritt, op. cit., pp. 178-180.
technical analysis are not the same things. Tape reading is a portion of technical analysis. Generally the tape reader does not make the extensive use of charts and ratios in making his decisions. In addition, tape reading is essentially a very short-term operation with many tape readers closing out their position each day.¹

Even though a tape reader claims that he needs no charts or information of any kind, other than that which comes over the ticker tape, upon which to base his decisions to buy or sell, it is believed that he carries a mental chart of the stocks in which he is operating. Successful tape readers operate in very few stocks; therefore it would be quite possible to remember the highs and lows in the stock over a period of time. This would give the support and resistance levels of the stock.

The essence of tape reading is the interpretation of the action of the volume. It is not price action, but volume: the amount of money, the supply and demand, which is supposed to tell the story. The main problem is to determine the balance of the supply and demand. Whether the demand is greater than the supply, in which case the price advances, or vice versa, and the price goes down. The action of the volume tells of the supply and demand; price merely denotes the value of the volume.

Humphrey B. Neill, in his early classic, outlines three main types of volume activity to be used in tape reading.

First: Increasing volume during an advance, with the intervening pauses or setbacks occurring on light volume. This is indicative of the underlying demand's being greater than the supply, and favors a resumption of the advance.

Second: Increased volume at the top of a rally, or of an advance, lasting for some time, with no appreciable gain in prices—an active churning of stock transactions without progress. This is indicative of a turning-point. [sp.]

Third: A "tired", or struggling, advance, when stocks creep upward on light volume and "die" at the top. This indicates a lack of demand (few buying orders); and, whereas selling orders likewise are light, this action frequently marks a "rounding-over" turn, which may be followed by increased volume on the down side (when the sellers see that they cannot hope for much higher prices at that time). These struggling trends are subject to sudden reversals, particularly when they have endured for several days. 1

In a declining market these same types of actions are present in a reversed form.

Essentially this covers the main points of tape reading. Naturally each trader has worked out various improvements and modifications, since tape reading is said to be more of an art, rather than a science. After experience and familiarity with varying types of markets, the trader is supposed to arrive at a stage where his intuition comes into play. He then has the "feel" of the tape.

G. M. Loeb, author, broker, and a long-time investment advisor on Wall Street, in a discussion of tape reading, said:

Aside from the very few people mentally equipped to succeed, actual, constant observation of the tape requires time. Conclusions

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are more likely to be short term than long term, hence tax factors are currently unfavorable. . . . The amount of capital that can be profitably employed by watching the tape exclusively is also rather limited with today's narrower markets.¹

Tape reading has some advantages in that it is a record of current transactions, in the sequence that they occur and it shows the trends for the day. In addition, if particular groups of stocks are favored, it will show which stocks within the group are favored first. However the average investor should probably depend on charts and other tabulations in making his investment decisions.

Technometer. It would probably be impossible to cover all of the methods that have been employed to forecast stock prices. Many were so obviously inferior and unsuccessful that the developer soon stopped publicizing them. Others undoubtedly have been kept secret or are for sale at a very high price, or have to be "interpreted" by the developer, for a fee. Some are so similar to other methods that it is difficult to discern any appreciable difference, other than the name. Finally new ones are undoubtedly being continually developed by hopefuls seeking an easy road to riches. Most of these can be regarded as some type of deviation, or ratios, or moving averages, or gadgets. Generally they are not very successful and little is heard about them.

One typical method with a very interesting sounding name is the

¹Loeb, op. cit., p. 270.
Technometer. This is a method which is based on the change in direction of a four-day moving average of daily closing prices of either individual stocks or an average of a number of stocks. When the four-day moving average turns up, a buy is indicated; when it turns down, a sell is indicated. However, the signals thus given are too numerous and often of minor importance, so that another factor is introduced for confirmation of the signal, namely, volume. If increased volume accompanies the signal, it should be acted upon. In order to properly determine increased volume four criteria are used. The volume on the day of the signal must be greater than (1) the average volume for four days, (2) the volume on the fourth day previous to the signal, (3) the volume on the day before the signal, and (4) the closing price on the day of the greatest volume during the four-day period must be in a direction to confirm the signal.

TABLE IV

TECHNOMETER GIVING A BUY SIGNAL WHEN PRICE AND MOVING AVERAGE OF VOLUME BOTH INCREASE

<table>
<thead>
<tr>
<th>Date</th>
<th>Prelim. Signal</th>
<th>Closing Price</th>
<th>Vol. of Trading</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>Confirmed</th>
</tr>
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<tbody>
<tr>
<td>2nd</td>
<td>-</td>
<td>66</td>
<td>4,700</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>5th</td>
<td>-</td>
<td>65 1/4</td>
<td>4,300</td>
<td>-</td>
<td>-</td>
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<tr>
<td>6th</td>
<td>-</td>
<td>63 1/2</td>
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<tr>
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<td>67 1/4</td>
<td>4,700</td>
<td>-</td>
<td>0</td>
<td>+</td>
<td>-</td>
<td>no</td>
</tr>
<tr>
<td>9th</td>
<td>buy</td>
<td>67</td>
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<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>no</td>
</tr>
<tr>
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<td>buy</td>
<td>66 3/4</td>
<td>4,300</td>
<td>-</td>
<td>-</td>
<td>+</td>
<td>-</td>
<td>no</td>
</tr>
<tr>
<td>13th</td>
<td>buy</td>
<td>67 1/4</td>
<td>5,800</td>
<td>4</td>
<td>+</td>
<td>4</td>
<td>+</td>
<td>buy</td>
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</table>
A plus sign is entered in the proper column on any day that one of the requirements is filled. If it is not filled, a minus sign is entered. A zero means no change one way or the other. After the first zero or minus sign, there is no need for any further calculation on that day. When all are pluses, however, action is signaled. In the illustration, it would be to buy because the price moving average turned up. If it had turned down, the signal would have been to sell. It is not necessary to calculate the moving average because its direction can be determined by comparing the price with that on the fourth preceding day. The close of $67 \frac{1}{4}$ on the 13th is higher than 66 on the 7th which makes the direction up. If the close on the 13th had been $65 \frac{1}{4}$ the signal would be to sell.\footnote{G. A. Drew, *New Methods for Profit in the Stock Market* (Boston: Metcalf Press, 1948), pp. 45-47.}

**Cylinder theory.** A method which places a somewhat different interpretation on the chart formation called a rectangle is the cylinder theory.

When a stock reaches a position which proves to be a top or bottom, the change from that position is never sudden. Instead, the stock at that position enters into a cylinder. This is a similar situation to that which occurs in the Dow theory when the averages are confined to a narrow pattern of fluctuations and "make a line."

The cylinder is a line of action for a security during the
course of which the movements of that security are narrow, they take
place within the close walls of the cylinder, the upper and lower walls.
The action of the stock within the cylinder is supposed to be particu-
larly significant and should be watched closely. Such factors as the
duration of the cylinder, the range of the stock movements within the
cylinder, the intensity of such movements, the frequency with which
the cylinder's walls are touched by the movements, are all believed to
be important indicators which cast a meaningful light on the future
action of that security.

A cylinder represents a change. Once a cylinder is identified,
the change is bound to occur. The action and nature of the cylinder
provides the clue to direction of the change.

The cylinder is analyzed from three basic viewpoints: (1) The
range of the cylinder, that is, the width of the cylinder within the
walls represented by the top line uniting the summits of the stock's
successive high prices and the bottom line uniting the bases of the
securities' successive low prices. (2) The swings within the cylinder.
As the stock moves within the cylinder, the widths of its motions are
measured, also their frequency and intensity. The stock, in the motion,
need not necessarily touch at all times the upper and lower level of
the cylinder. (3) The duration of the cylinder, the time during which
the cylinder lasts.

Range and swings may be broad and narrow. A broad range may
be accompanied by predominantly broad swings, but it may also be
accompanied by either broad or narrow swings. It is conceivable that the narrow swings in a broad range may measure less than the broad swings in a narrow range.

The special significance that range, swings, and duration of the cylinder carry with them may be represented as follows:

<table>
<thead>
<tr>
<th>Range</th>
<th>Swings</th>
<th>Duration</th>
<th>Market action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Broad</td>
<td>Broad</td>
<td></td>
<td>Lower prices</td>
</tr>
<tr>
<td>Broad</td>
<td>Narrow</td>
<td></td>
<td>Probably lower prices</td>
</tr>
<tr>
<td>Narrow</td>
<td>Broad</td>
<td></td>
<td>Probably higher prices</td>
</tr>
<tr>
<td>Narrow</td>
<td>Narrow</td>
<td>Long</td>
<td>Higher prices</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Short</td>
<td>Lower prices</td>
</tr>
</tbody>
</table>

The chart above must be read first in terms of range and swings. The conclusions then reached must be referred to the duration of the cylinder, which may either confirm or contradict the previous conclusion. Should the character of the cylinder's duration confirm the previous conclusion, then, of course, the decision is final. Should the conclusion, instead, be contradicted by the cylinder's duration, then the picture is confused, though the elements of broadness and narrowness may be more important than that of duration. The feature of narrowness of the range is almost invariably indicative of a condition calling for a market's advance and vice versa.1

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1Flumiani, op. cit., pp. 34–36.
Gadgets. Many technicians have devised methods for computing deviations from an imaginary normal. Thus any marked deviation from this normal provides a signal. However, fundamental changes are always invalidating these imaginary normals and, frequently, pronounced deviations manage to persist for many years. Deviations are well worth studying, for whenever one is observed it merits further inquiry to discover whether it is justified or not. But any mechanical interpretation can prove costly.

The same might be said about gadgets. Many work part of the time because they were developed by someone who was struck by a series of sequences which develop a "pattern" for logical and valid reasons. As long as these reasons carry some weight, the gadgets will work. Ultimately, after a few successes, the gadgets dominate and the underlying reasons are forgotten. Then the gadgeteer feels that the reasons don't matter and even if the contrivance moves for no good reason, the sequences will follow. The basic weakness of gadgets is that the great forces which determine the ebb and flow of security prices are always changing and their significance, as they appear in the gadget, has changed meaning. There are a vast number of variables in the stock market equation and they change in significance all of the time. The gadgeteer makes the mistake of assuming a constant relationship between a few variables.
IV. SUMMARY

Ratios, moving averages, and charts appear to be the primary tools of the technical analyst in selecting a particular stock for purchase.

Tape reading cannot be engaged in by the average investor because of the time required to watch the tape and the skill necessary to interpret it. Few rely on gadgets in making their investment decisions owing to the lack of reliability. The cylinder theory is merely another chart formation with a more elaborate interpretation placed upon it.

Ratios and moving averages, such as the Technometer, essentially make use of the inertia in stock prices and try to follow the trend, while the charts attempt to anticipate it. The ratios and moving averages should enable one to follow a stock successfully; however the signals will be late and an investor could be whipsawed with too many signals.

Charts have the biggest following among the technical analysts. The vertical line type keeps track of time, price, and volume, while the point and figure charts are primarily concerned with price reversals. The major patterns of each were described and then they were applied to a large number of stocks. Subsequent market action indicated very poor results with the point and figure charts, while some of the formations in the vertical line charts seemed to work fairly well in indicating future moves.
Undoubtedly there are other methods which are being employed to forecast stock prices; however, either they have been kept secret or else the writer was unable to locate them.
CHAPTER VI

SUMMARY AND CONCLUSIONS

The writer believes that the principal technical or so-called internal methods of forecasting the stock market have been sufficiently covered in order to arrive at some significant conclusions. The conclusions are preceded by a brief summary of the findings of the study.

I. SUMMARY

The first phase of this study covered the first three chapters and included definitions of the subject matter and a presentation of the background material. It was reiterated that forecasting is an essential part of economics and that, perhaps, the greatest efforts have been directed toward forecasting the prices of common stocks and their trends. A variety of reasons were advanced to explain this, but they were subordinate to one all-important dominating reason: obviously it was the tremendous amount of money represented by the stock market.

Even though the earlier studies reported nothing but failure in attempting to forecast the stock market, it was established that stock prices are an economic time series with a certain amount of inertia in them. This gave them a tendency to move in the same direction, in trends, rather than to reverse frequently. Thus a case for scientific analysis of stock prices was justified.

A study of the forces affecting stock prices revealed that they
could be roughly divided into two groups: first, the economic forces such as the business cycle, interest rates, and national growth, and, secondly, the noneconomic forces such as wars, government intervention, and all of the psychological factors.

A comparison of the two major approaches to forecasting was made: the fundamental or external approach, which studies factors outside of the market, and the technical or internal approach, which considers only the stock prices and the volume of shares traded. The fundamental approach was eliminated as a possibility owing to the fact that this method only considered part of the factors affecting stock prices and they moved too slowly to provide a proper basis for forecasting. This was verified by the results of the various cycle studies which disclosed that the stock prices and volume of shares traded turned ahead of all the other economic indicators. Therefore any successful forecast of stock prices would have to be an internal method.

Even though internal analysis appeared to be the only feasible approach to forecasting, it was revealed that a large part of it did nothing more than attempt to identify a stock price trend at an early stage and allow an investor to follow it until it turned. This was still satisfactory from an investor's standpoint because it would enable him to share in a large portion of the stock's gain and the primary purpose of forecasting is to capture as much of this gain as possible.

The other side of internal analysis was explained, in which market students, not content with only half of a stock's gain, wanted
it all; and the methods which they employed to actually anticipate or forecast the start and turning points of the trend, or, in other words, the stock prices themselves.

Chapter IV was devoted to the second phase of this study, which attempted to cover the internal methods for either following or anticipating the trend of the market as a whole, as measured by the Dow Jones industrials or one of the other market averages. Studies have revealed that nearly every stock advances when the trend of the market is up and most decline when the trend is going down. Therefore it is of the utmost importance to know in which direction the trend is moving.

Possibly one of the earliest and still important internal approaches is the Dow theory. This was originally intended to be an indicator of business conditions, but it was soon discovered that it enabled one to identify the market's trend early and follow it until a turn was signaled. It is still regarded by many as a sound method of following the market. In the last twenty years it has not been conspicuously successful and by its very nature a practitioner misses about one-half to two-thirds of a stock's advance. Therefore many other attempts have been made to enable one to follow the trend closer than the Dow theory does. Chief among them are the moving averages of various types. All of them, however, result in an investor losing a sizable portion of a stock's gain. This has spurred students on to greater efforts to find a method or combination of methods which would identify a trend as soon as it starts and not after it has run one-third to one-half, or possibly more, of its course.
Of the many methods used to anticipate the market's trend, five principal groups were covered. These consisted of price ratios, volume ratios, trading ratios, cycles, and the breadth of the market data. All of these seemed to reveal information about the market but much of it was valueless to an investor.

The price ratios, such as low-priced stocks versus high-priced, and the trading ratios, such as short sales or odd-lot indexes, while interesting, did not appear to be established on a very firm theoretical basis. No group of traders is so consistently wrong that a trading method can be developed to enable one to do just the opposite and thus capitalize on the group's errors. However, once the direction of the trend has been established, the price ratios can show what group of stocks is doing better than the market, as a whole, and narrow the choice of stocks to that group.

An example of another type of price ratio was Molodovsky's low-priced aggregate versus high-priced aggregate. This index hasn't been much in evidence the last few years. It was shown that it is not the price of a stock but the quality which results in the wide fluctuations of price.

Cycle analysis hasn't been successful either. Even though cycles seem to appear in the stock prices, only average periods can be found and this is not satisfactory to a trader. It is possible that either there are no cycles in stock prices or frequent changing of the averages used to measure the market's movements makes them unrecognizable or
else not enough work has been done yet to solve the problem. They should serve to warn an investor that no stock will increase in price indefinitely.

The study of the volume of shares traded was interesting, particularly when it was shown how its moving average reached a peak ahead of the stock prices and turned down and later it turned up ahead of the stock prices during the summer of 1959. Unfortunately, though, a number of other studies, covering a much longer time period, revealed that the correlation between the volume of shares traded and stock prices was very poor.

In the breadth of the market data the advance and decline ratios and the new highs and new low ratios appeared to supply the most information about the market. The study revealed that the advance and declines did not indicate a break in the market but, after a break had occurred, they would signal a change in the trend. The ratio of new highs to the total issues traded, when plotted on a seven-day moving average, formed an index which turned down in advance of the Dow Jones industrial average.

These two indexes then were the most important revelations of this section of the study. If further examination, over a much longer time period, were to reveal a dependable correlation between them and the Dow Jones industrials it would enable the trader to spend all of his time in selecting stocks rather than worrying about the trend of the market.
Even though the market's trend could be identified and the turning points anticipated, the biggest problem remains unsolved, namely, which particular stock to buy. Chapter V went into this problem and examined the major tools of technical analysis.

Again, if one were content with capturing only a part of the stock's gain it could be done through ratio analysis. It is a simple matter to divide the price of the stock each week by the Dow Jones industrial average. This gives the ratio of the individual stock to the market average and it is entered on the chart as a solid line. When the line goes up the stock is doing better than the average and when it goes down, worse.

Because of its inability to realize the full gain of a stock this method was only secondary. Of primary importance to the technician are his charts used to forecast the actual stock prices. Both point and figure and the more common vertical line charts were analyzed. This study tested, by subsequent market action, the recommendations presented by two point and figure "experts," based upon their charts. Interestingly enough, each used a slightly different type of charting procedure. In both instances their recommendations were proven to be faulty by later market action.

It is believed that the various forces of supply and demand will cause a stock to form a variety of significant formations, when a line connecting its high, low, and closing prices is marked on a chart each day or each week. Many of these formations are supposed to appear
only at turning points in a stock's price trend or while the stock is building up a great deal of pressure prior to a sudden and swift advance. Others are believed to foretell a decline.

These formations which appeared in the vertical line charts were illustrated and their technical significance discussed. The theory holds that certain formations are definite indicators of future market action, not only as to direction but to the length of the move as well. This was very difficult to test because a frequently heard criticism is that many of the formations require more imagination than technical skill in order to recognize them.

This was the main problem of testing them and it would have been eliminated if it had been possible to either locate a number of charts with these formations indicated on them, by experts, or else a number of stock recommendations by forecasters who used this type of chart. In either case subsequent market action would soon disclose the worth of these formations in revealing future price movements. Unfortunately it was not possible to secure either one.

The writer recognized his inability to test them adequately and properly. Nevertheless it was believed essential that they be subjected to some sort of a limited test to see if they agreed at all with the theory. Daily price charts of one hundred stocks for a period of one year were secured. Next the writer attempted to indicate upon them all of the formations which were apparent and did not require any imagination to see. This was an effort to avoid the loudest criticism.
Next every formation which, according to the theory, had some sort of measuring implication or was supposed to indicate a turning point was recorded. From there it was merely a case of measuring on the chart, from the "breakout" point of the formation, to see if later prices moved in the proper direction as far as they were supposed to.

Brief as this test was, it had some interesting revelations: First, no major bottom formations were discovered; the market was in pretty much of an uptrend for the period and this served to reinforce the belief that most stocks go up together and down together. Second, very few major top formations were apparent. This could mean that either they are quite rare and other types of formations could also serve to indicate a top or else the steep drop of the market in the late summer of 1959 was not a major turning point of the market. Third, a number of the formations appeared to agree close enough with the theory to warrant additional study.

Besides ratio analysis and charts, technical analysts employ tape reading and innumerable types of deviations and gadgets as an aid to forecasting. Though various claims are made, this study was unable to locate any degree of success with these procedures.

II. CONCLUSIONS

This study has shown that: (1) no reliable method has been developed and made known to forecast stock prices; (2) it should theoretically be possible to forecast them within limits; and (3) internal
analysis has the best chance. However, (1) the many variable factors, particularly noneconomic ones, affecting stock prices and the ever-present chance of sudden government intervention, make any forecast unreliable; (2) if one acts to any great extent on the basis of his forecast, or if the method is generally known and others act on it to any great extent, it will throw the forecast off; but (3) it should be possible to set up trading procedures that would make allowances for all of this.

It must be remembered that there can be no such thing as a scientific prediction of economic events under human control. The very "dependability" of such a prediction would cause human action which would invalidate it. That is why charting can never become a science. If it did it would defeat its own purpose. The past record of all publicly known systems shows that they have not been successful and cannot be. Obviously the reason is that the more successful it is the more followers it will have, and the more followers it has, the less profit it can bring. Thus the action of the followers would counteract the expected. A study of charts can only indicate where the market has been and how far it has risen or fallen in its long swings.

Any forecasting of the stock market can never have the high probability that is found in the physical sciences. There are too many variables to permit the close prediction that is possible in those fields. Therefore one must appreciate and accept the limits within which forecasters operate in predicting stock price movements and the
inevitable and large margins of error.

Despite the lack of success in forecasting which must be reported here, the numerous attempts to forecast have not been in vain. These have added greatly to man's knowledge of the stock market and, by building on these attempts, technical analysis has been able to develop trading procedures which are right more often than wrong.
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TABLE V

TECHNICAL FORMATIONS WHICH APPEARED ON 100 DAILY STOCK PRICE CHARTS OVER THE PERIOD FROM 9-29-58 TO 9-25-59

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### TABLE VI

**CHARTCRAFT SELL RECOMMENDATIONS ON SEPTEMBER 18, 1959, AND THE STOCK PRICES AT THE END OF THE FOLLOWING THREE MONTHS**

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Figure 13. Head-and-shoulders formation in the Dow Jones industrial average, 1959. (Data from The Wall Street Journal)
Figure 14. Broadening formation in the Dow Jones industrial average, 1959-60. (Data from The Wall Street Journal)
Figure 15. Ascending triangle and a rectangle, 1958-59 (data from The Wall Street Journal).
Figure 16. Various technical patterns with the buy points indicated with a "B" and the sell points indicated with an "S," 1958-59. (Data from The Wall Street Journal)
Eastern Airlines, Inc.

Figure 17. Rectangle, rising wedge, and ascending triangle, 1958-59. (Data from The Wall Street Journal)
Figure 18. Point and figure chart of Dow-Jones industrials with possible future targets indicated. (Source: Schulz, John W. "Technical Perspective," Forbes, LXXXIV, January, 1960)