

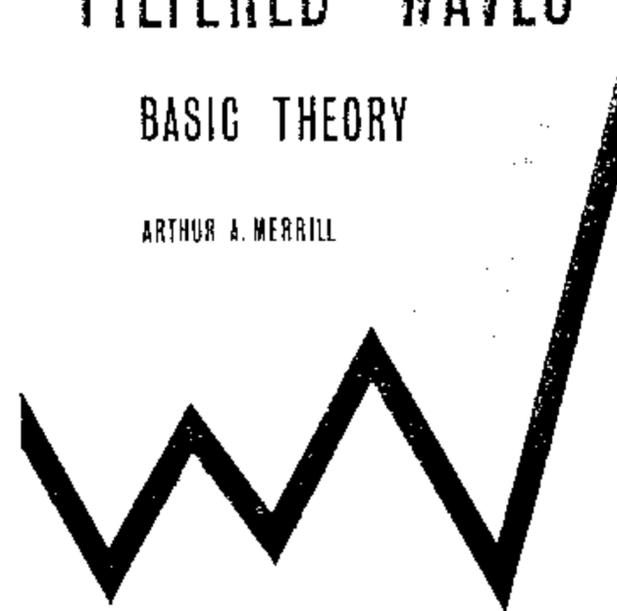
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FILTERED WAVES

BASIC THEORY

ARTHUR A. MERRILL



A TOOL FOR
STOCK MARKET
ANALYSIS

Published by

The Analysis Press, Chappaqua, New York



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Printed in the United States of America.

Published by
The Analysis Press, Chappaqua, New York.

Library of Congress Catalog Card No. 77-77420
ISBN: 0-911894-36-5

First Edition, First Printing
10 9 8 7 6 5 4 3 2 1

DEDICATION

To ELSIE

Always helpful; always inspiring.

FILTERED WAVES - BASIC THEORY

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"I often say that when you can measure what you are speaking about, and express it in numbers, you know something about it; but when you cannot express it in numbers, your knowledge is of a meagre and unsatisfactory kind; it may be the beginning of knowledge, but you have scarcely in your thoughts advanced to the stage of Science, whatever the matter may be."

- Sir William Thomson, Lord Kelvin

Chapter 1. WHY THIS BOOK ?

The reason for this book is in the quotation above. The chapters which follow develop a method for measuring waves and evaluating turning points. It expresses this knowledge in numbers.

The measuring device developed in these pages is an amplitude filter. Chemists use paper filters to remove suspended material from a solution; electrical engineers use filters to remove undesirable frequencies from a circuit; biologists use filters to measure the size of small particles. In this book we measure waves by the filter required to eliminate them. In simpler terms; if we say that we will ignore all swings of less than 6%, we are using a 6% filter.

The use of a filter permits simplification. Stock market prices move in waves within waves within waves; this can be confusing. If a filter is used, the important swings are clearly evident.

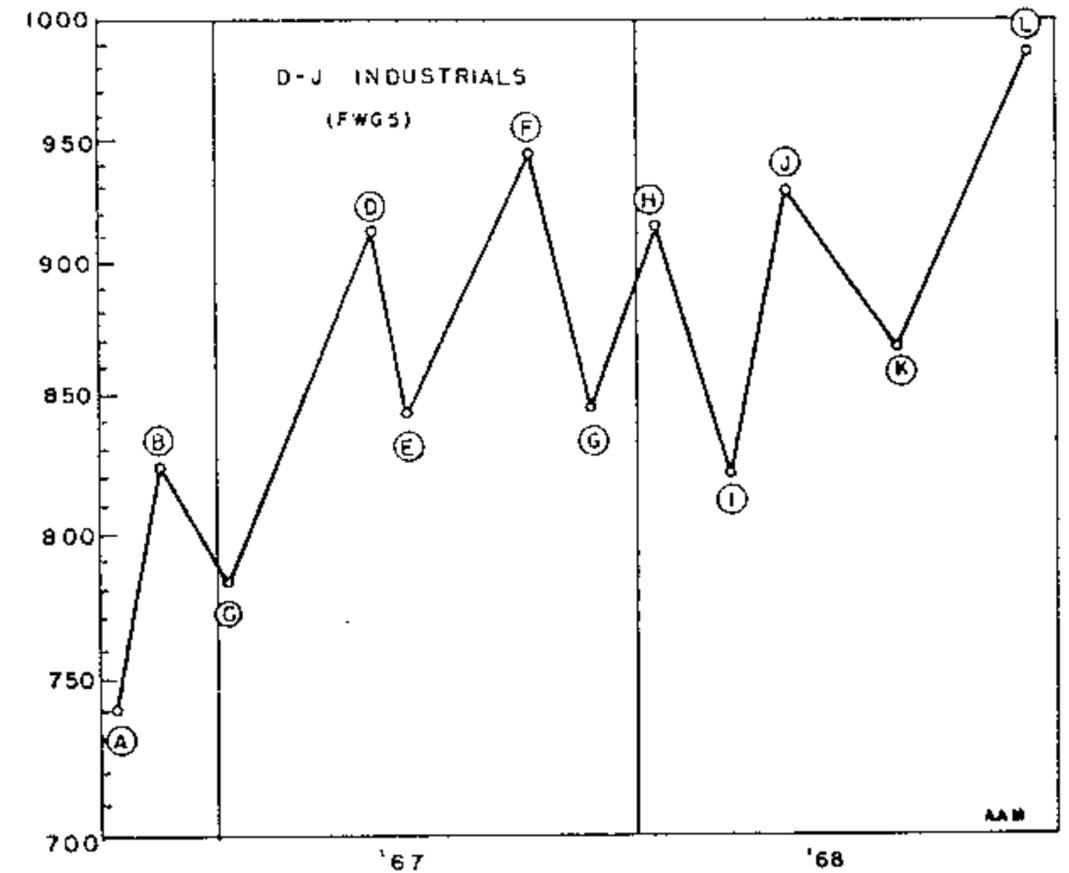
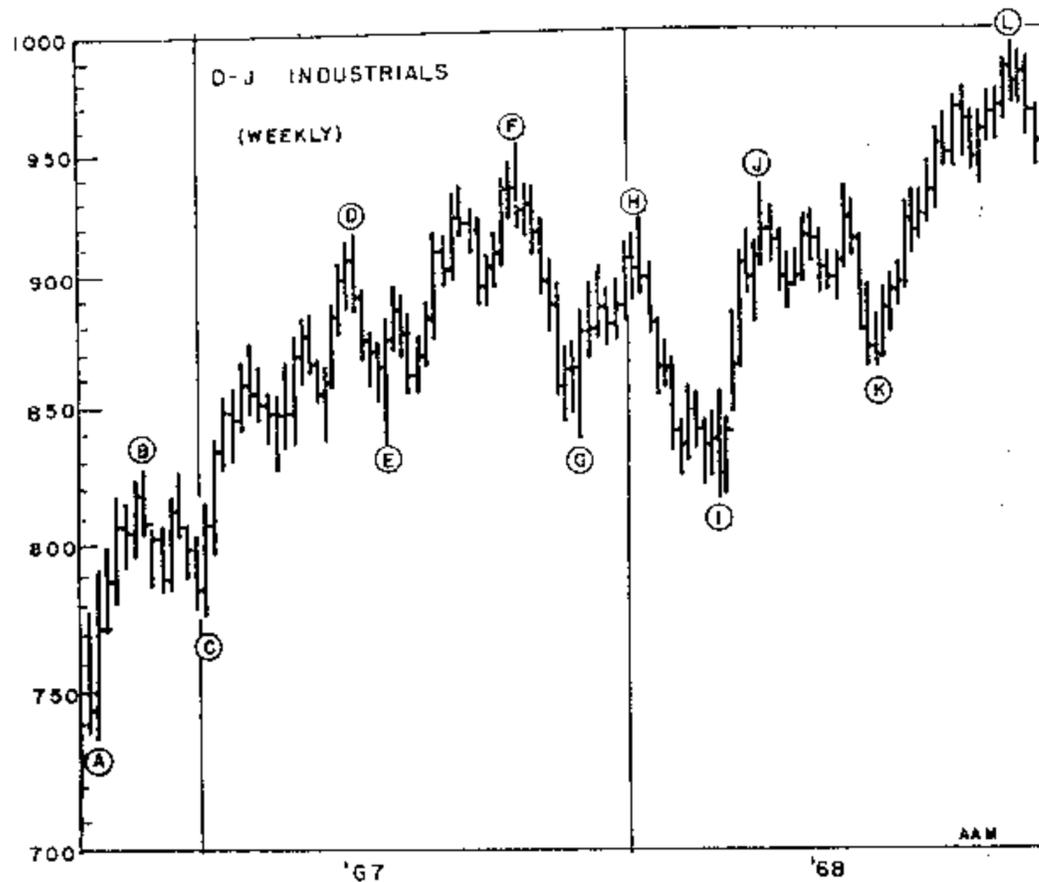
The most important feature of the method, however, is in the measurement of waves and turning points. Swings and turning points can be classified, counted, examined, and expressed in numbers.

Turning points are important in many other methods. In the Dow Theory, the break of prices through a turning point is significant; in the Elliott Wave Theory, legs are counted between turning points; trend lines are drawn through turning points. When these turning points can be evaluated, some of the rules of other methods can be translated into numbers, counted, and verified.

The method is simple. Answers can be found by multiplication and division. The measures are specific; twenty careful men examining the same data will produce twenty identical results.

The methods are completely described in the first five short chapters. The remainder of the chapters and the Appendixes will put the methods to work. The appendixes supply, also, historical material to assist future investigations.

To return to the quotation above, the aim of this book is to assist market analysis to develop from an indefinite "art" to the stage of Science.



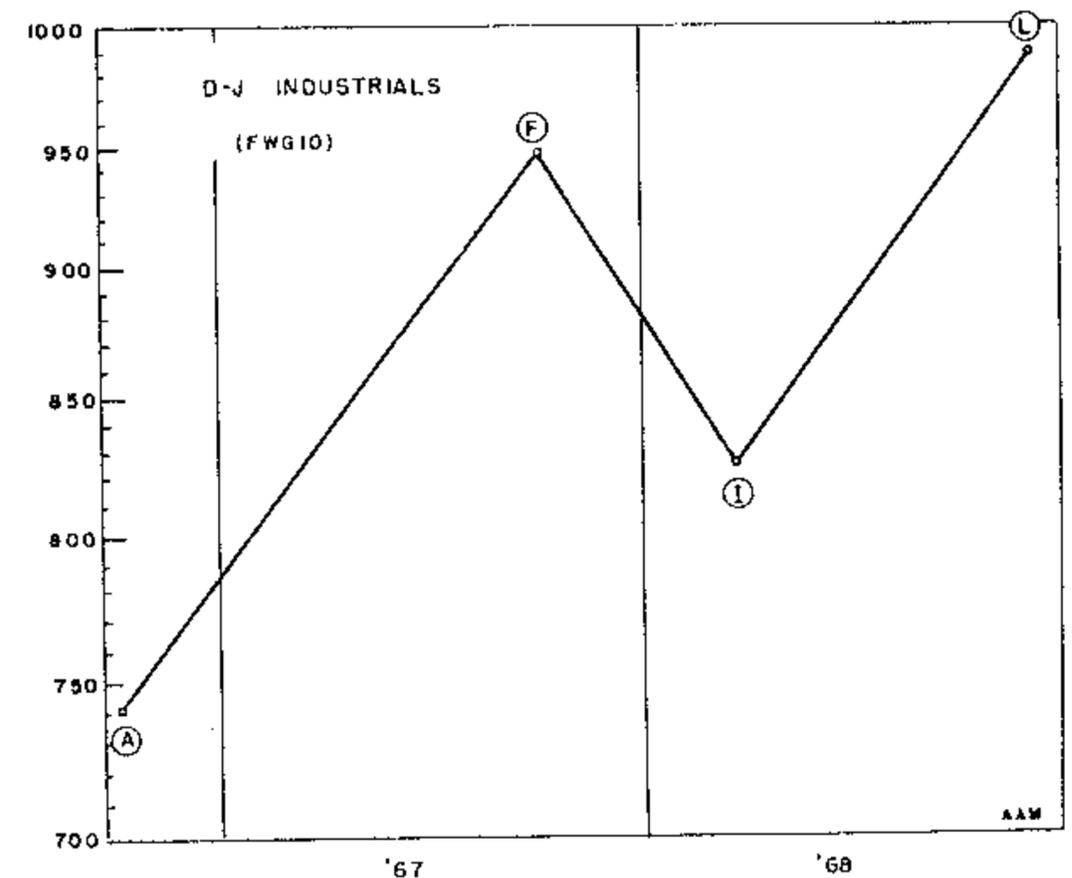
Chapter 2. WHAT IS A FILTERED WAVE ?

This method proposes simple classification of waves by amplitude. The amplitude used is the overall swing from the highest point to the lowest. (a)

Consider the 1966-1968 bull market, which is charted above. In the chart at the top of the next page we have filtered out all minor swings of less than 5%, and have connected the peaks and valleys of the larger swings with simple straight lines. The designation "FWG5" is the abbreviation of "Filtered Waves Greater than 5%."

In the chart at the bottom of the next page we have filtered out all waves of less than 10% (FWG10). Note that waves B-C, D-E, G-H, and J-K have disappeared.

(a) Some analysts have measured amplitude by the deviation of prices from a moving average. This is a good method, but it involves some calculation, and the determination of the proper period of the moving average.

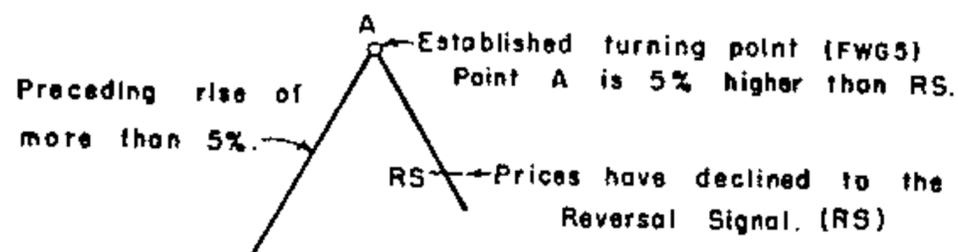


Chapter 3. HOW CAN THE TURNING POINTS OF FILTERABLE WAVES BE LOCATED ?

The first step is to decide the smallest wave to be charted. This is the filter size. In our studies of the swings of the Dow Jones Industrials in the appendixes, we have used a minimum of 5% (FWG5).

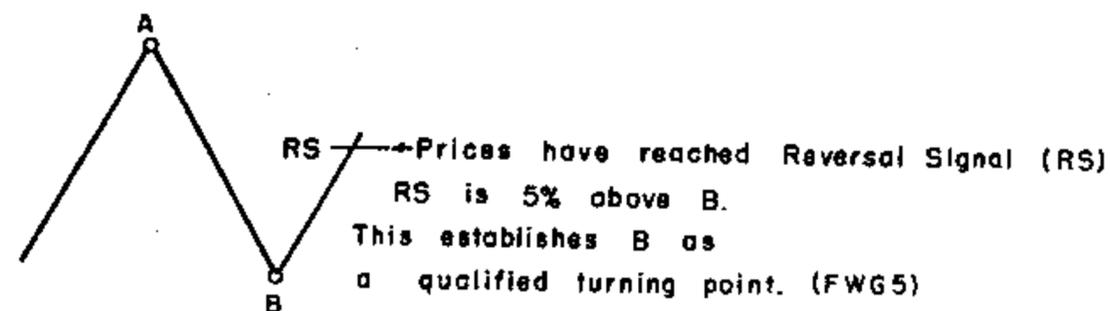
Suppose, for example, that we use a filter of 5%, and that prices have been rising, and have risen more than 5%. We continue to note new highs made in the swing, and for each new high point achieved, we divide by 105% to get a new reversal signal (RS). Now suppose that prices start to decline. We do nothing until the RS point is reached. When this occurs, we know that we have been in a qualifying decline since the last high point. This establishes the high point as a qualified turning point which can be plotted on a chart.

In graphic form, the situation is this:



(Point and figure students will note that this procedure is similar to the change from a rising column to a declining column. In the procedure outlined above, percentage figures are used instead of points.)

Now that prices are declining, new low points are noted. As each new low point is made, it is multiplied by 105%, to get a new reversal signal (RS). If prices turn around and start upward, nothing is done until the RS level is reached. When this occurs, the preceding low point is established as a qualified turning point, and can be plotted on a chart. The situation is as follows:



Prices are now rising, and we return to the procedure described in the second paragraph of this chapter.

A worksheet for this procedure is in Appendix I.

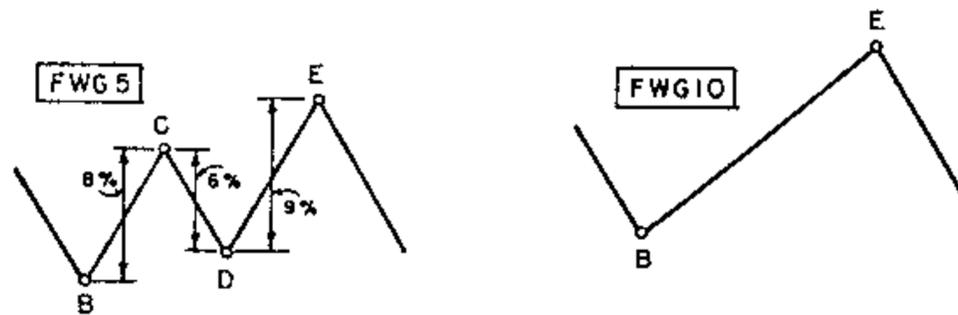
"Nat'ralists observe a Flea
 "Hath smaller Fleas that on him prey.
 "And these have smaller Fleas to bite 'em,
 "And so proceed ad infinitum."
 - Dean Swift - 1733

Chapter 4. HOW CAN A WAVE BE IDENTIFIED AND MEASURED ?

We measure a wave by the vertical distance between turning points, expressed as a percent of the lowest point.

To put upswings and downswings on the same basis, we always put 100% at the lowest point. Here's an example of this need: Suppose that in a depression your salary is cut 10% (of the high point). Later when business improves, your pay is increased by 10%. This doesn't restore your pay cut, since the increase percentage is now based on the low point

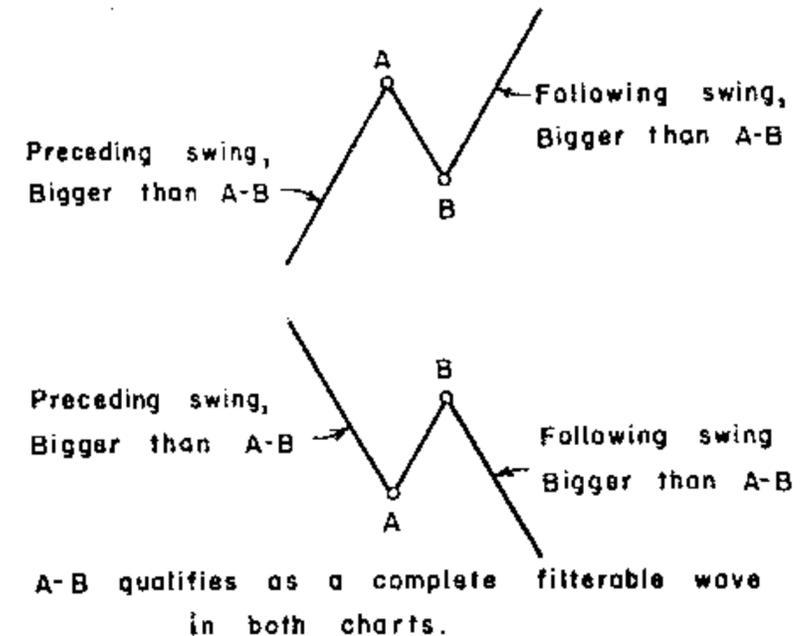
Before a filterable wave can be measured, it must be identified. Two adjacent turning points may not be a complete swing; they may be part of a larger swing in the same direction. Note this chart:



The left hand chart shows all waves of more than 5% (FWG5), the right hand chart uses a 10% filter. (FWG10)

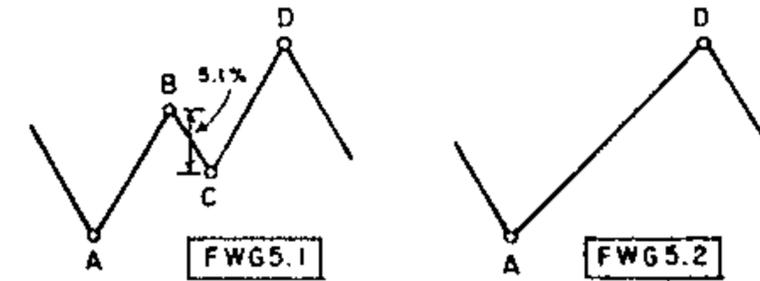
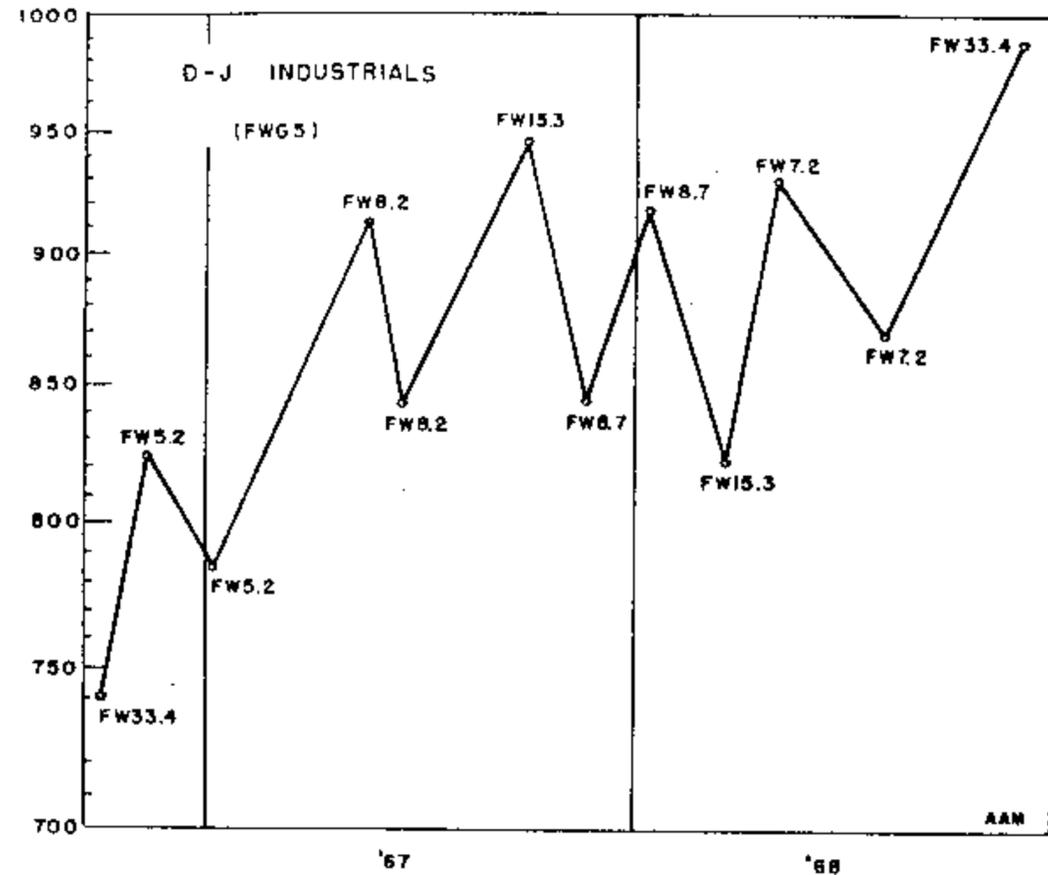
Note that the upswing B-C, although it is only 8%, is not eliminated by the 10% filter. It is part of the larger upswing B-E. The same is true of the upswing D-E. The wave C-D, however, completely disappears; it is a filterable wave.

The requirements for a complete swing are then evident; the swing must be smaller than both the previous swing and the swing which follows:



HOW CAN TURNING POINTS BE EVALUATED ?

Note the two charts below. The one at the left uses a 5.1% filter (FWG5.1); the one at the right uses the slightly higher filter of 5.2% (FWG5.2). Point B is 5.1% above point C.



Note the turning points B and C. Now you see them; now you don't. They vanish when the filter is raised from 5.1 to 5.2 .

This provides a simple method for the evaluation of turning points. Their importance can be measured by the filter required to eliminate them.

The general rule is this: When a wave becomes a complete filterable wave (using the criteria in Chapter 4), the terminal points of the wave can be labeled with the amplitude of the wave.

For an example, consider the 1966-1968 bull market which was charted in Chapter 2. In the chart opposite, we have labelled the turning points with their FW evaluations.

We have put these labels on all of the turning points (FWG5) of all of the bull and bear markets since 1898. These can be found in Appendix III. Note that the tabulations in this appendix can simplify analytical work; if you wish to draw the chart of the D-J Industrials for any filter above 5%, you can use the points in the table with a higher FW number, and ignore the points with a lower number.

This chapter completes the definitions and methods of measurement in the filtered wave theory. The remaining chapters will discuss applications of the method.

Chapter 6. CAN FILTERED WAVES BE USED WITH OTHER METHODS ?

Dow Theory: A brief outline of this theory is in Appendix V. One of the important ideas in this method is that trends can be discovered when a price breaks through a previous high point or low point. Minor high and low points are useful only for minor trends; major high and low points are required for major trends. The filtered wave theory can evaluate turning points.

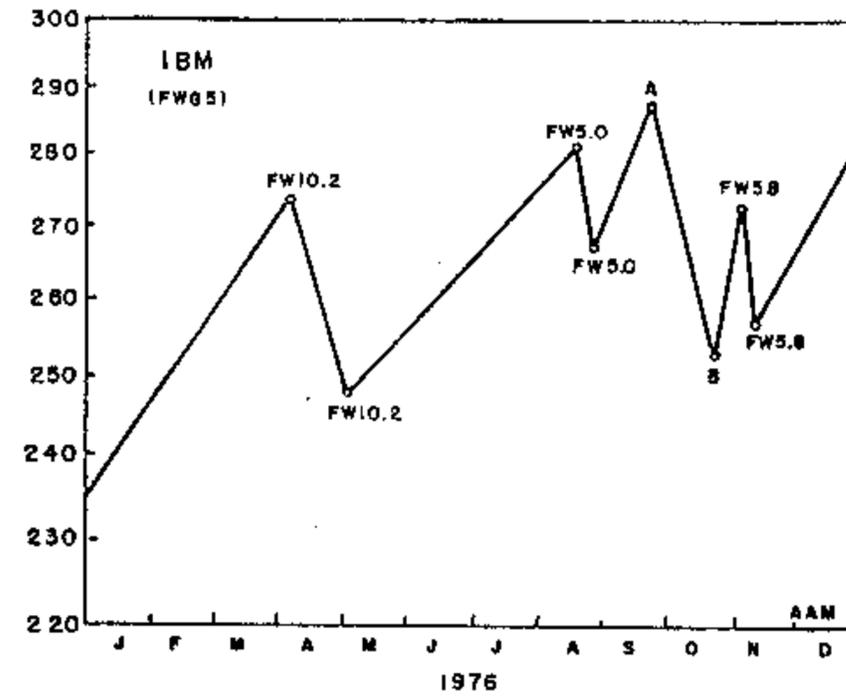
Elliott Wave Theory: A complete outline of Elliott's precepts is in Appendix VI. Elliott was rather vague in his requirements for waves of various magnitudes, and practitioners often disagree about turning points. Filtered waves can contribute by definitely placing turning points of any specified magnitude. Elliott students will find fuel for analysis in the bull and bear market charts in Appendix III.

Chart "formations": Some repetitive price behavior on charts has been classified in graphic terms, such as triangles, pennants, and coils. These "formations" stand out boldly when prices are charted as filtered waves.

Dernell Every Classification: The classification used by Mr. Dernell Every is outlined in Appendix VII. It can be used with filtered waves.

Point and Figure: Filtered wave methods closely parallel those of the point and figure chart. More space is required for charting a filtered wave, but there are some advantages. The chart includes the important variable, time; it permits a logarithmic scale, improving trend lines; a curve of volume can be added.

Trend lines: Trend lines are drawn through turning points. A trend through minor turning points can be extrapolated a short way; trends through important turning points can be projected farther into the future. Filtered waves evaluate turning points; which can then evaluate the trend lines based on the points. Also, filtered waves can be charted on a logarithmic scale. This permits geometric trend lines, which are more valid for price trends.

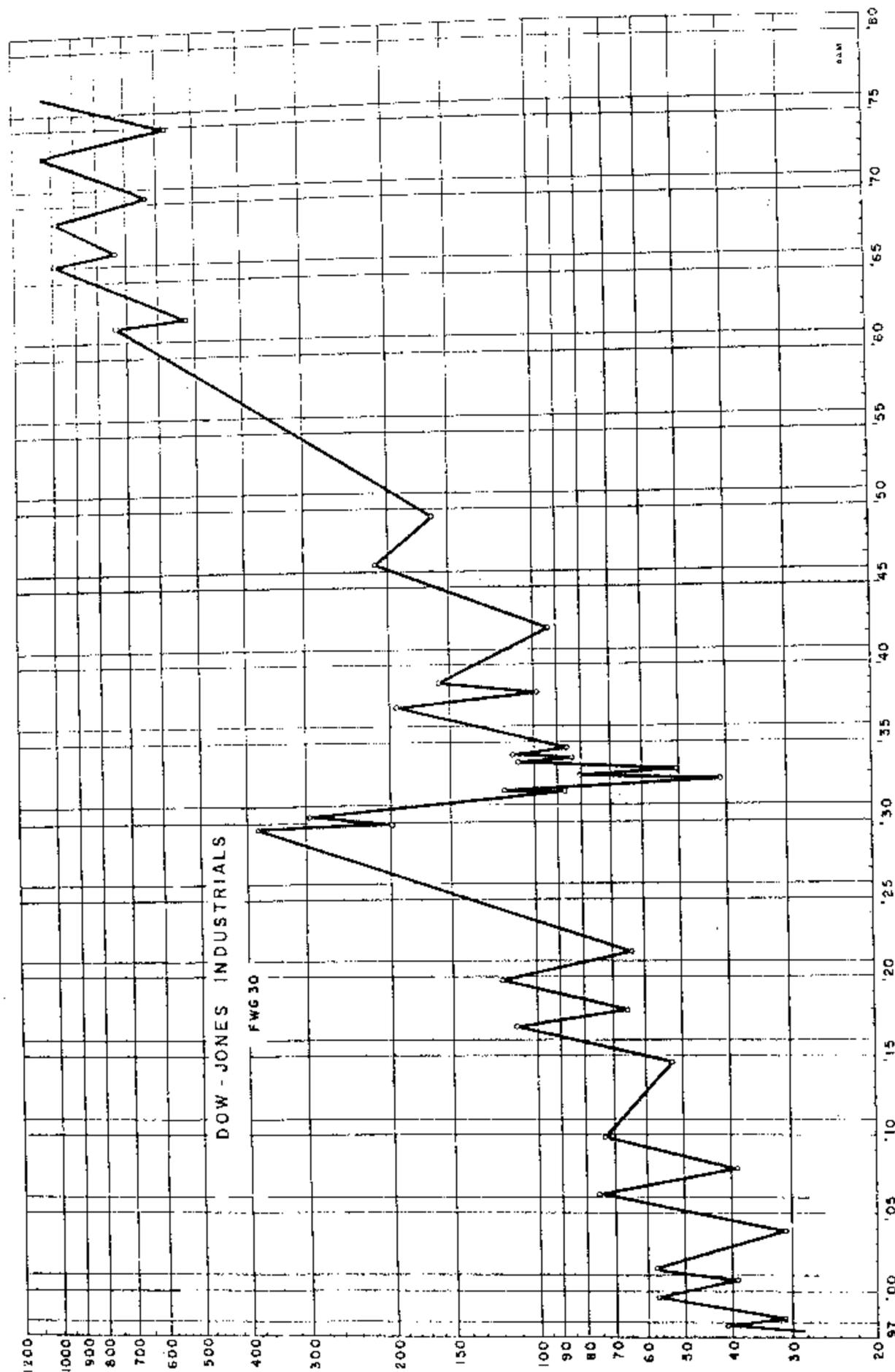


Chapter 7

CAN FILTERED WAVES BE USED WITH INDIVIDUAL STOCKS ?

The charts in earlier chapters were taken from the D-J Industrial Average. Exactly the same methods can be used for other indexes, and for individual stocks. The worksheet described in Appendix I is for a single stock.

The chart above is an example, using price swings of IBM in the year 1976.



Chapter 8

HOW BIG IS A BULL? HOW BIG IS A BEAR?

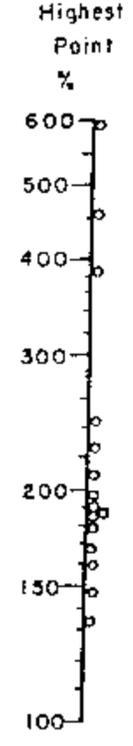
After consulting stock market histories, we find that a filter of 30% (FWG30) works quite well as a definition of a bull or bear market. Swings of larger than 30% include all of the accepted bull and bear markets, and a few that are marginal. If we exclude two sharp rallies in the 1929-1932 bear market, and two sharp secondaries in the 1933-1937 bull market, we find 15 bear and 15 complete bull markets since 1898. We have charted these bull and bear markets, using 5% and 10% filters, and have labelled all of the turning points with their FW numbers. These charts will be found in Appendix III. To make the swings comparable, all of the bull and bear markets have started at 100.

How big were these bull and bear markets? How long did they last? How many reactions (or rallies)? The distributions are in the charts which follow. The quartiles and medians are below (smoothed):

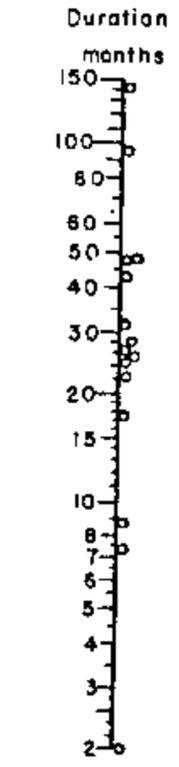
	quartile:	median:	quartile:
Total amplitude, in percent of initial turning point:			
bull markets:	233	195	164
bear markets:	66	59	53
Duration, months:			
bull markets:	41	28	15
bear markets:	28	18	10
Number of secondary reactions, bull markets:			
FWG5	11	6	4
FWG10	3	2	1
Number of rallies, bear markets:			
FWG5	12	9	5
FWG10	5	3	1

(Elliott wave students will be pleased to see the preponderance of two reactions in the bull markets using FWG10. The record isn't encouraging, however, in bear markets -- too many legs!)

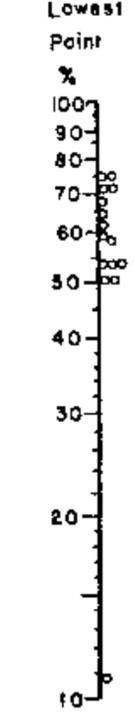
15 Bull Markets



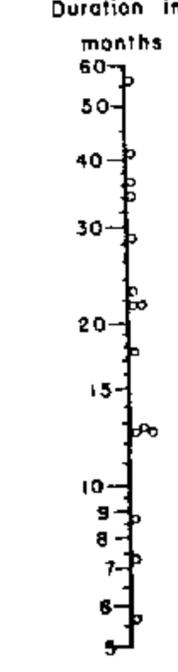
15 Bull Markets



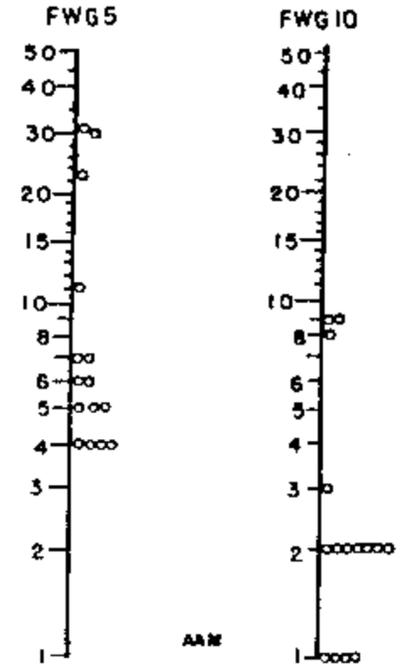
15. Bear Markets



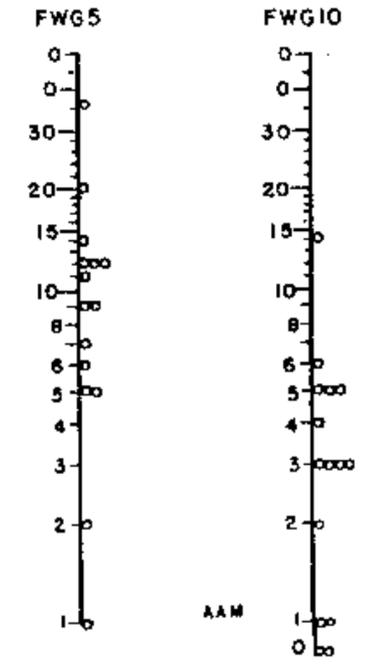
15 Bear Markets

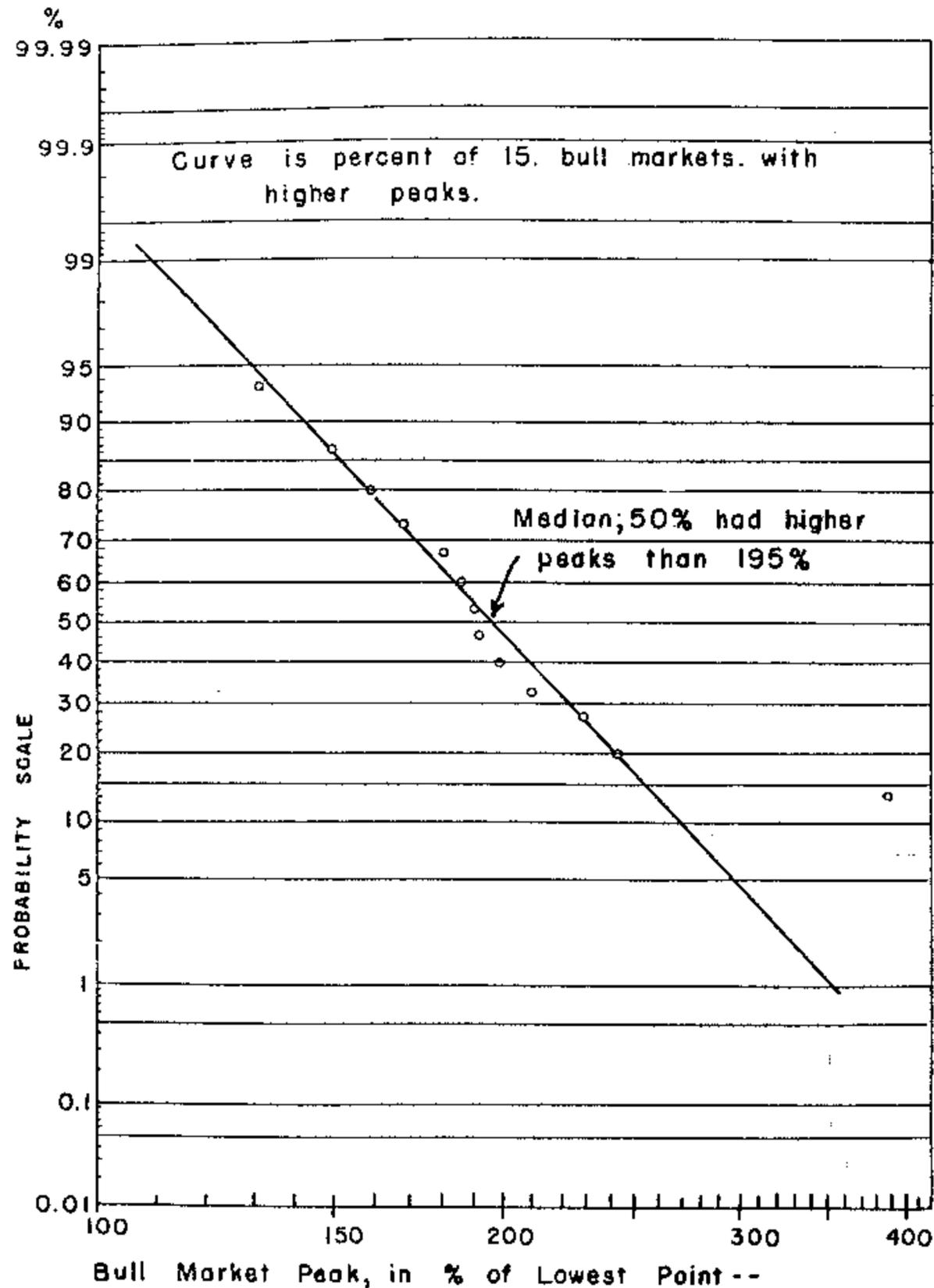


15. Bull Markets
Number of Reactions



15. Bear Markets
Number of Rallies:





Chapter 9

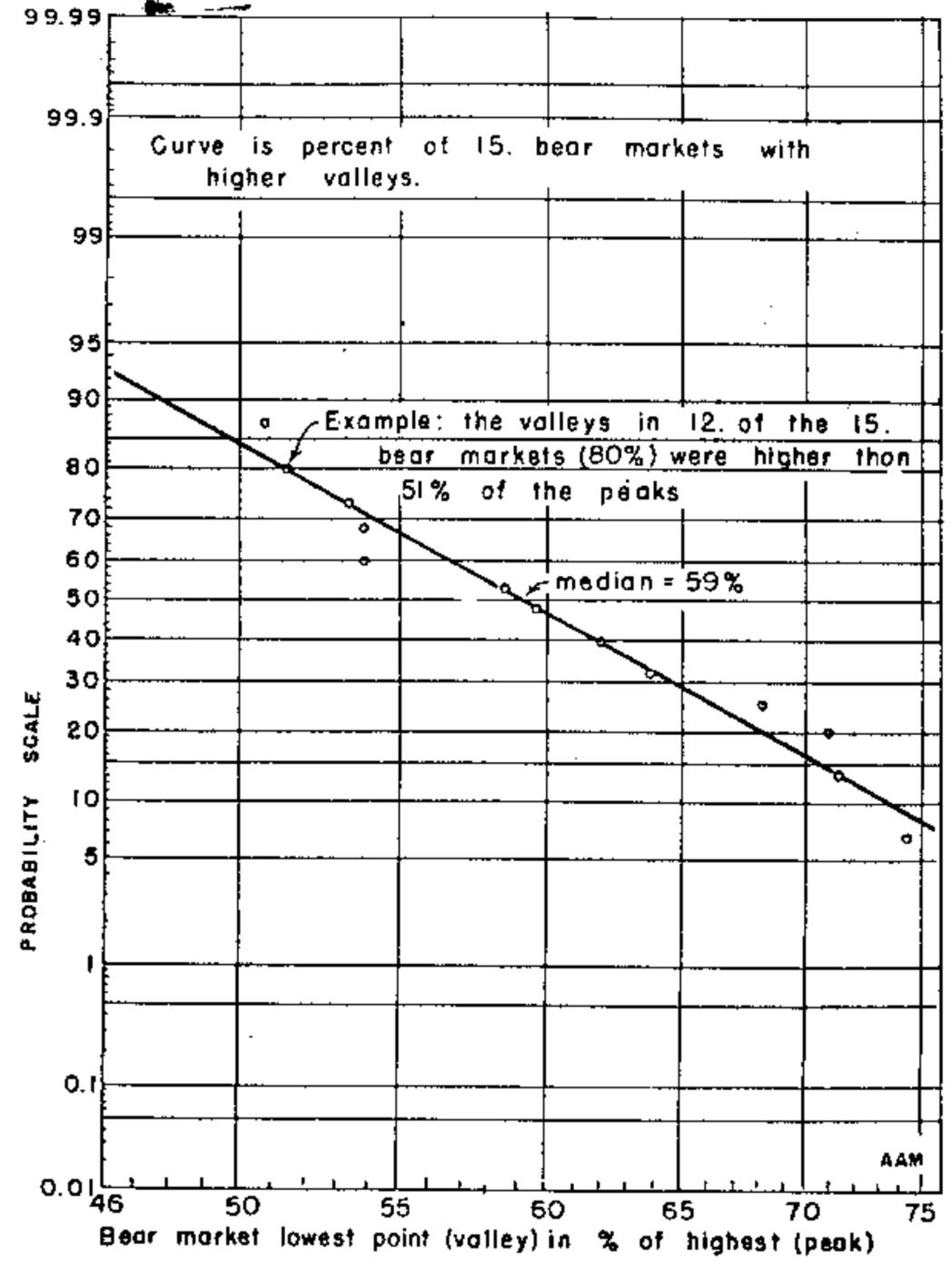
WHAT IS THE LIFE EXPECTANCY OF A BULL? A BEAR?

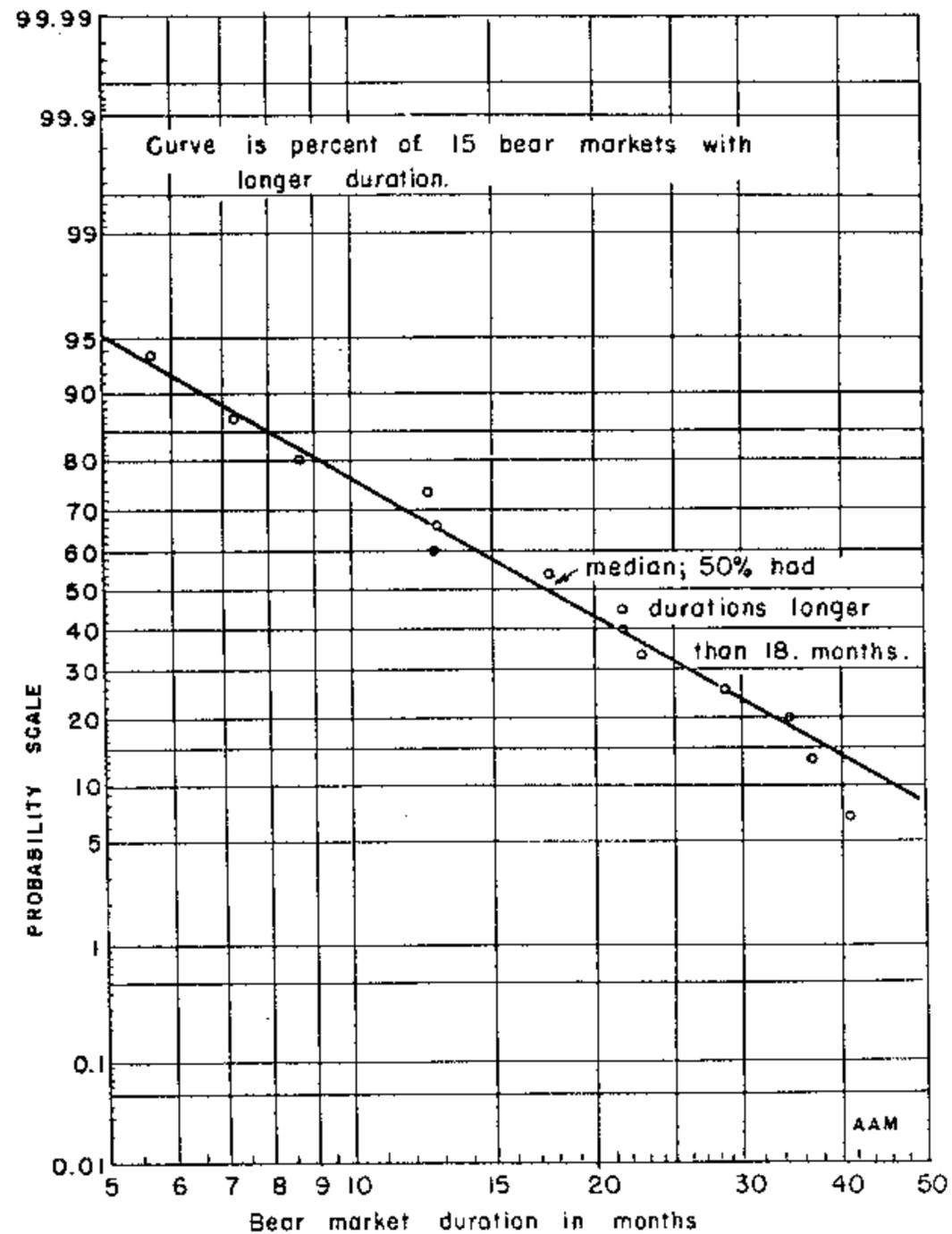
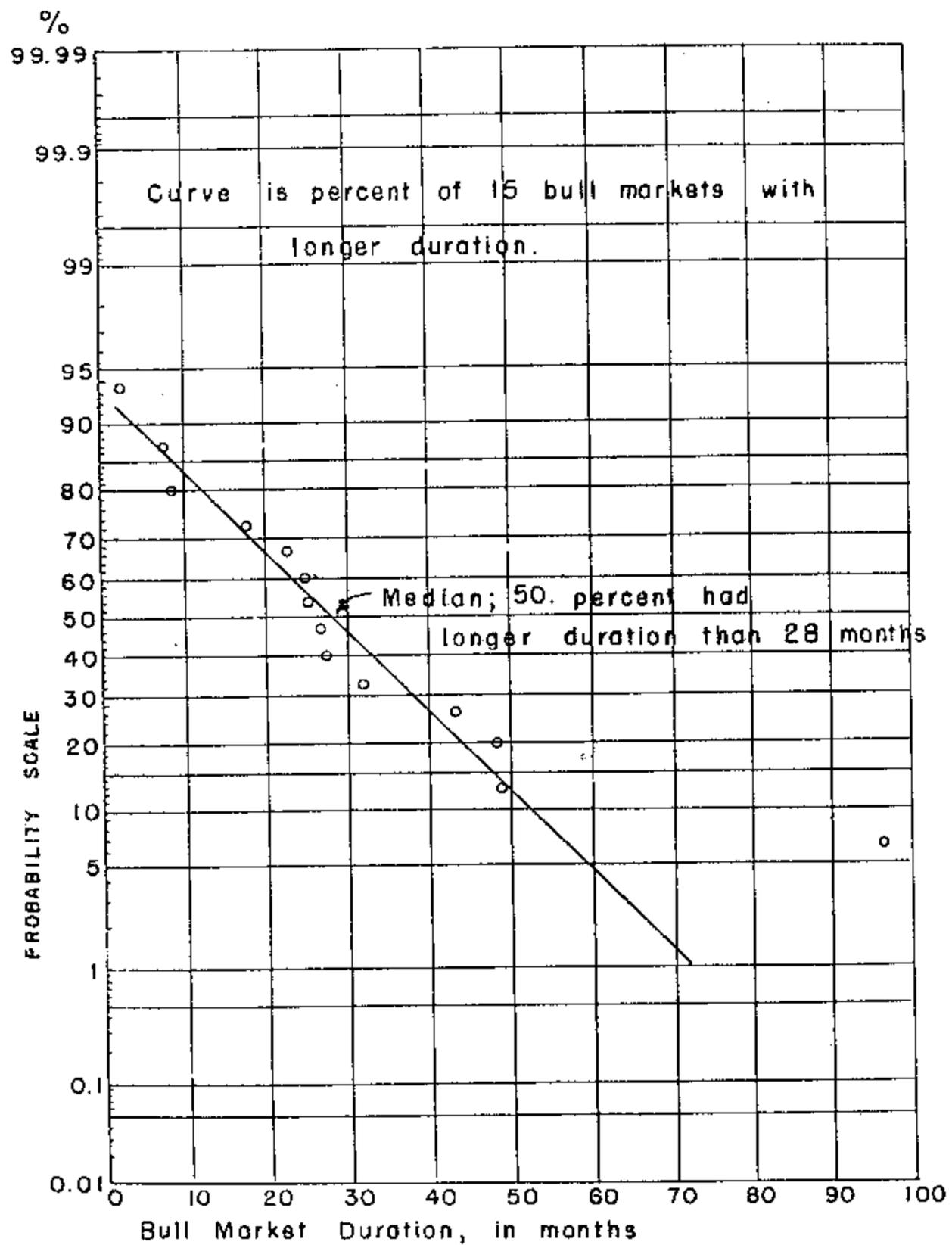
If we are in a bull market, or a bear market, we would like to know how long we should expect to continue before the trend reverses. The first clue is in the distribution charts in the preceding chapter. These will tell us whether our bull or bear market is youthful, or relatively old.

We can go a step further, by taking an idea from the work of life insurance actuaries. They construct tables of life expectancy, based on experience. A twenty three year old person, can, on the average, expect to see fifty more years. A 37 year old person is half way, and can expect 37 more. A person of seventy can expect another 12 years.

We can apply this "life expectancy" to the life of bull and bear markets. We are dealing with small numbers, so that our conclusions won't have a high reliability. But we can do some analysis with the help of a probability chart.

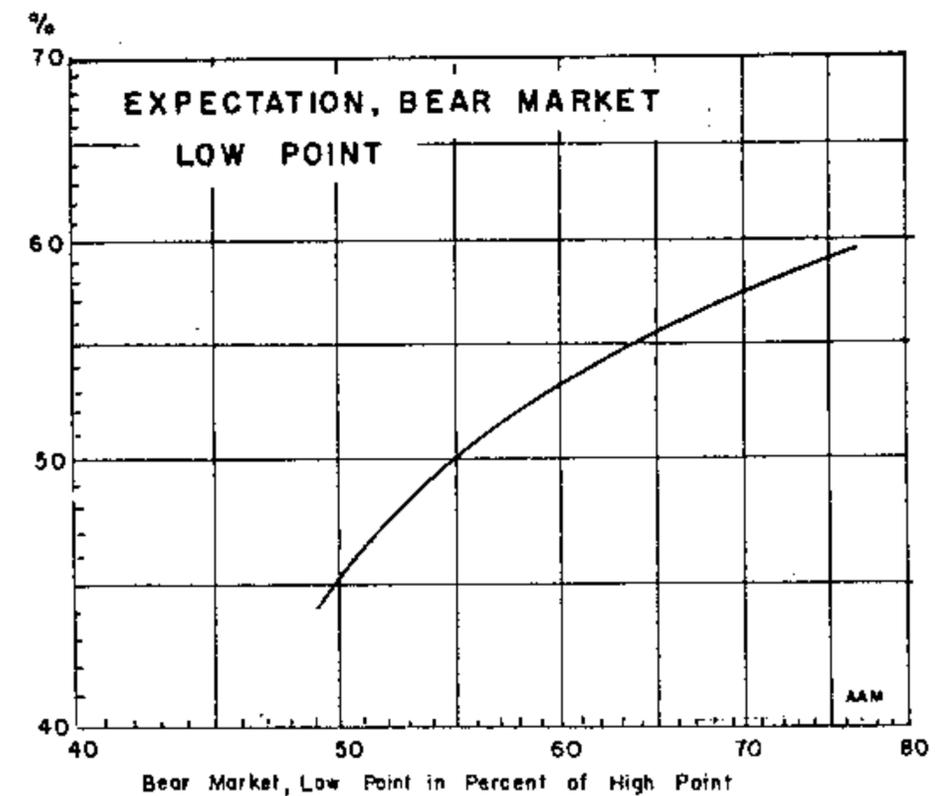
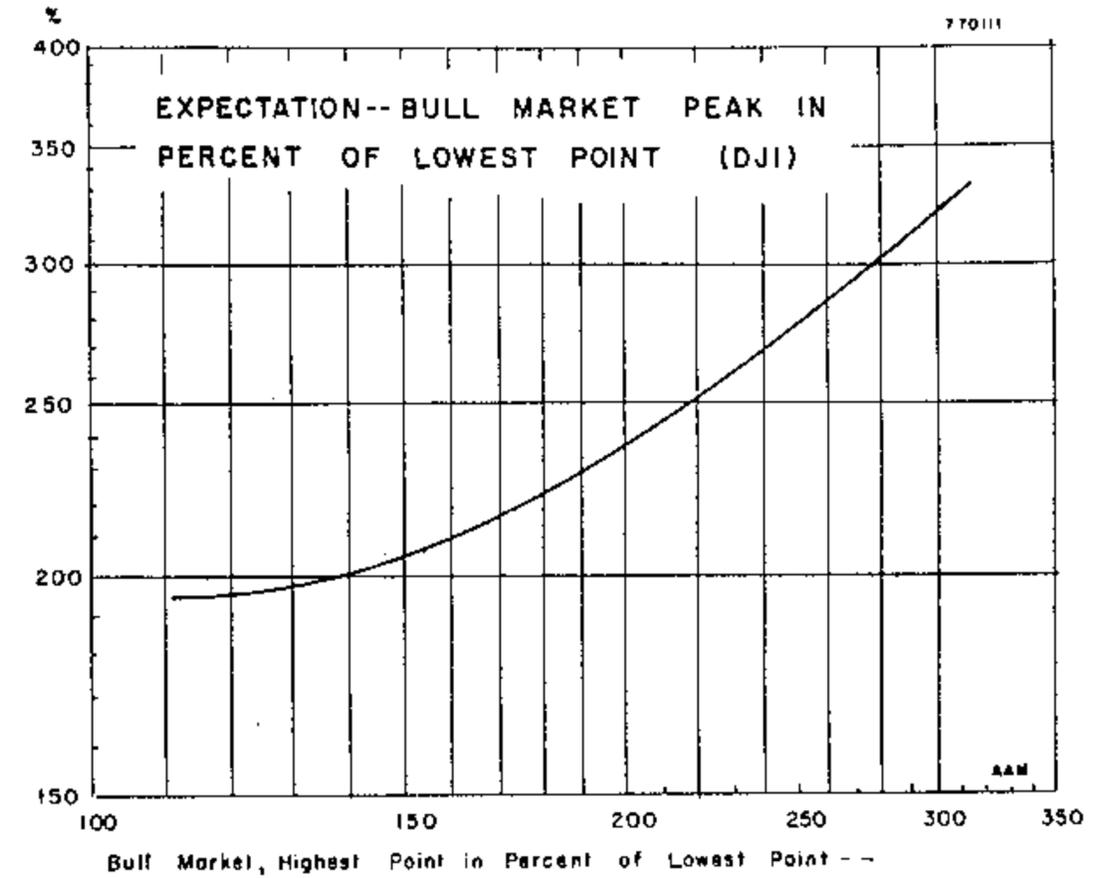
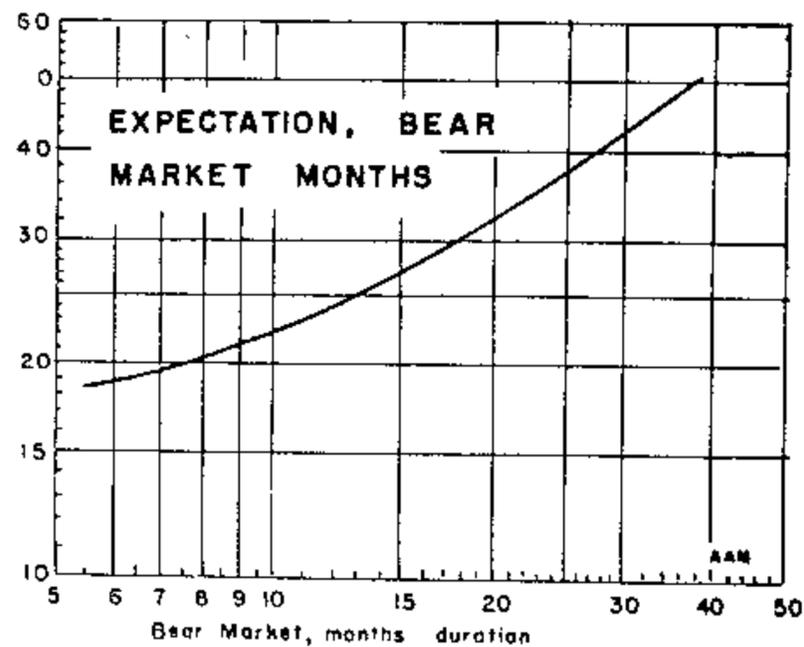
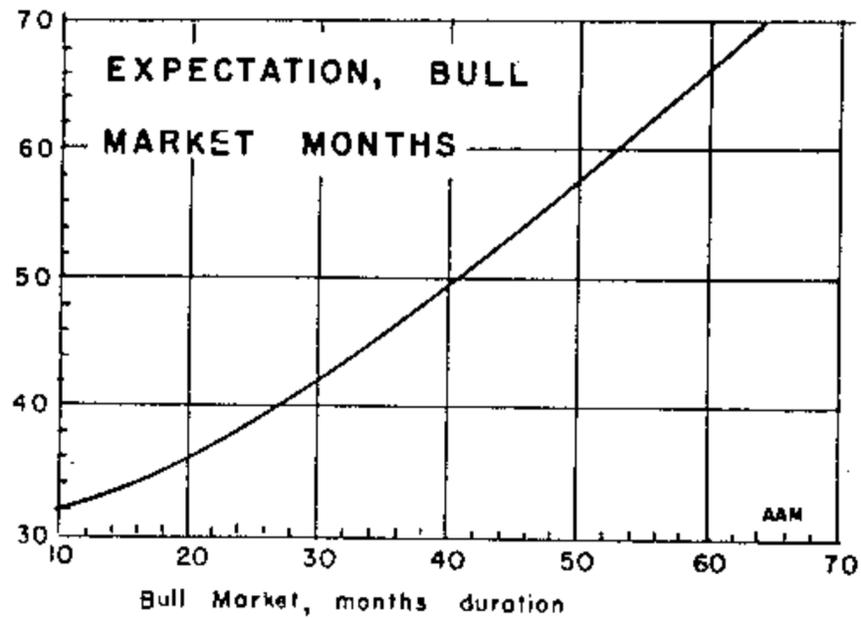
Note the chart on the opposite page. We have cumulated the distribution figures. Statisticians call this an ogive. The left hand scale is a probability scale, designed to straighten the ogive of a normal distribution. We have helped the straightening process by using a logarithmic scale on the X axis. The chart may seem a bit sophisticated, but it's easy to read. For example, find 180% on the horizontal scale. Go up to the curve, and you will see that 65% of the 15 bull markets rose to a peak higher than 180% of the initial turning point. The circles on the chart reflect actual data; we have drawn the curve to approximate the points.





The preceding probability curves can then be used to construct the expectation charts on these two pages.

For example, suppose that we are in a bull market, which has risen 40% (to 140% of its lowest point). The upper chart to the right shows that, on the average, bull markets which have reached this size have continued on to 200% of the lowest point.



Chapter 10

HOW BIG ARE PRIMARY SWINGS, SECONDARY REACTIONS, AND RALLIES ?

With the aid of filtered waves, we can apply the methods of the preceding chapter to secondary reactions and rallies. These charts have been put in Appendix IV.

We have used these definitions:

In a bull market:

Swings upward are called primary swings.

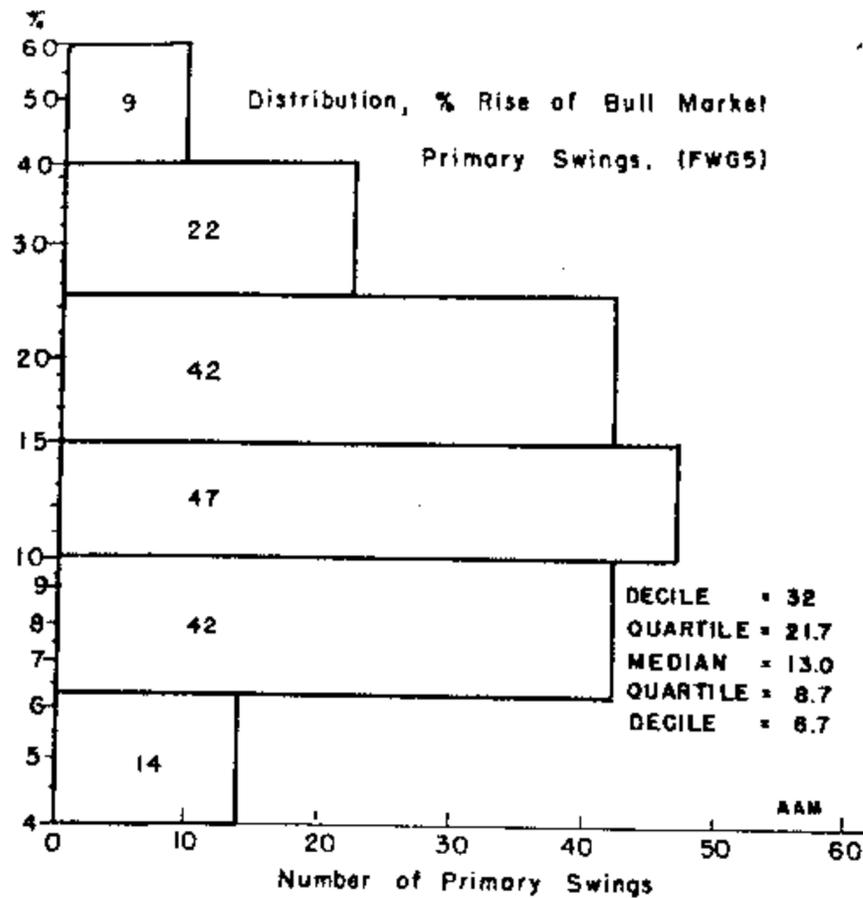
Swings downward are called secondary reactions.

In a bear market:

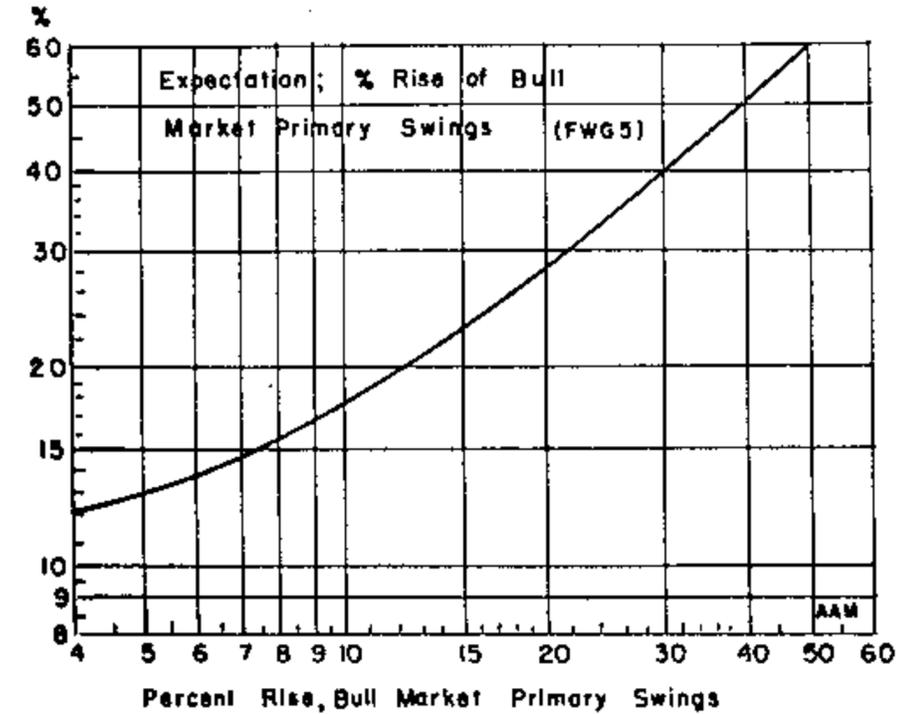
Swings downward are called primary swings.

Swings upward are called rallies.

We have prepared charts of the extent of swing and duration for each of the above types, using filters of FWG5 and FWG10. This makes a total of 48 charts! To find your way to the charts for any situation, you can use the index in the front of this book.



Suppose that you are in a bull market, in an upward (primary) swing of more than 5%, and you would like to know the probable extent of the swing, before a reaction of 5% sets in. Suppose that the Dow, in this swing has risen 10%. The charts in the Appendix for this situation are duplicated above and to the right. First, consider the distribution above. Ten percent is less than average (13%), so we can certainly expect a bigger swing. Now find 10% on the lower scale of the expectation chart to the right. The curve shows that the average expectation is 18%; we can expect, on the average, to have an additional rise of 8%.



HOW BIG IS A RETRACEMENT ?

Charles Dow wrote in an editorial (1901 or 1902): "A much more practicable theory is that founded on the law of action and reaction. It seems a fact that a primary movement in the market will generally have a secondary movement in the opposite direction of at least three-eighths of the primary movement... The law seems to hold good no matter how far the advance goes." Later writers developed the rule "one third to two thirds of the previous move."

Is this a dependable guide? We have checked it, with the aid of filtered waves.

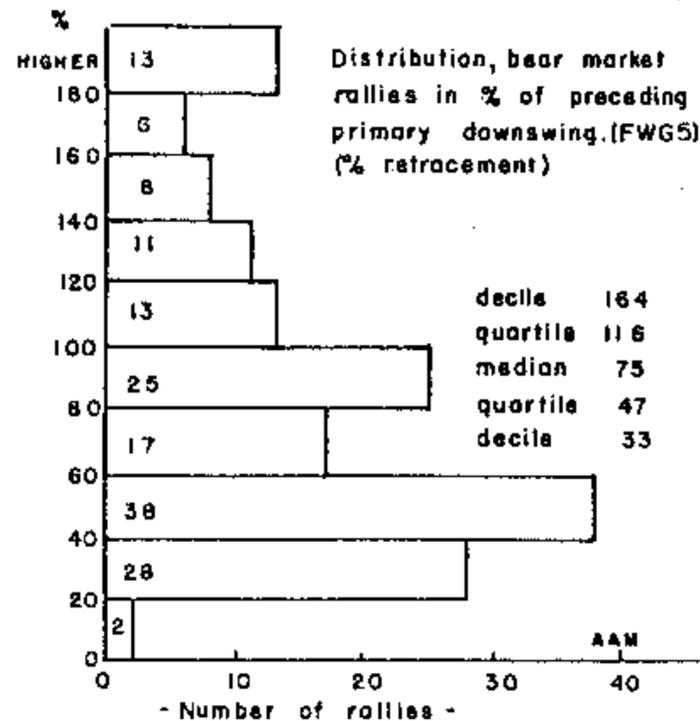
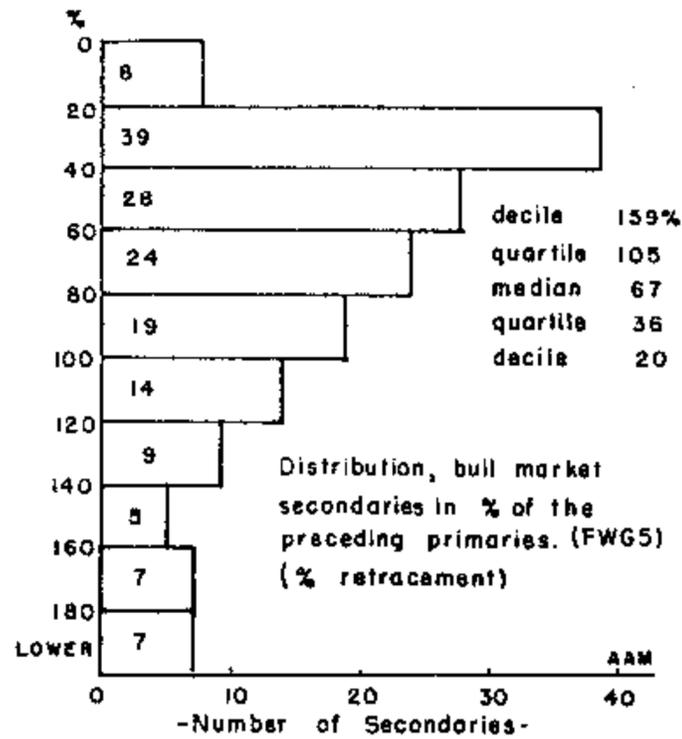
The upper chart shows the distribution of 160 bull market secondaries (FWG5), each expressed as a percent of the preceding primary move. We find only 29% in the 1/3 to 2/3 area; 21% were less than 1/3; 50% were more than 2/3.

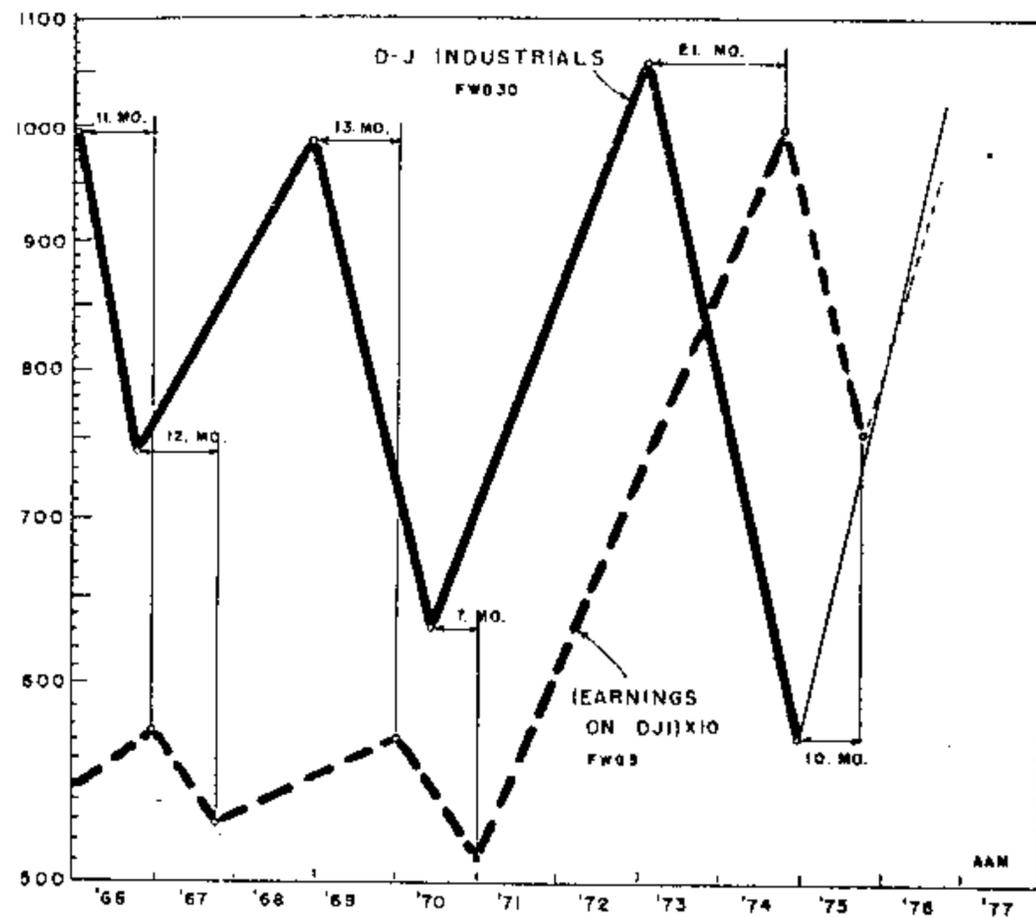
The lower chart presents the distribution of 161 bear market rallies (FWG5), each expressed as a percent of the preceding primary downswing. Only 35% were in the 1/3 to 2/3 area; 11% were less than 1/3; 54% were more than 2/3.

Before setting up a guide, though, we checked the correlation of the size of reactions and rallies with the size of the preceding primary swing, and found no significant evidence of correlation. Here's the score:

Coefficient of correlation:	FWG5	FWG10
Bull market secondaries:	0.09	-0.13
Bear market rallies:	0.24	0.35

Our conclusion: don't depend on the size of the preceding primary swing as a guide to the size of a rally or reaction.





Chapter 12

CAN FILTERED WAVES HELP IN THE CHECKING OF LEAD TIME?

Stock market indicators are believed to move in advance of stock prices. Is this true? Sophisticated computer programs can check correlations for various lead times; a quick visual check can be made by tracing one curve and superimposing it on another.

Filtered waves can provide a simple check by the location of turning points.

Note the figure opposite. Stock prices are believed to lead earnings. Is this true? Can investors successfully anticipate future earnings? In this figure we have charted the bull and bear markets of the last eleven years, using a 30% filter. The dashed line plots the earnings of the D-J Industrials, using a 5% filter. The earnings are multiplied by ten so that the same scale can be used for both curves. The earnings are charted at the end of each period, although the figures aren't available until later.

To simplify analysis, the filter sizes can be selected to make the number of turning points approximately the same for each curve. In this case, prices are more volatile than earnings, and a filter of 5% gives six turning points, matching the six turning points of the FWG30 price curve.

The distance between turning points can then be measured. In this case, the first down turn of prices preceded the first downturn of earnings by eleven months; the other leads, in order, are 12, 13, 7, 21, and 10 months. The median is twelve months.

This chart is interesting for another reason. Note that earnings quite often move counter to prices; earnings quite often rise in bear markets and decline in bull markets.

Chapter 13 CONCLUSIONS

Chapters one to five set up a foundation; simple methods were developed for the evaluation of swings and turning points.

Chapters six to twelve gave examples of the application of the method.

The Appendix includes historical detail, which can serve as the basis for future work.

This is only the beginning. Future work can evaluate the importance of volume; it can study the rate of change; it can be used to check the timing and value of market indicators. The opportunities are challenging.

Appendix I.

FILTERED WAVE WORKSHEET

An example is on the following page. The stock is Allis Chalmers; the month is January 1977.

In this example, a 10% filter (FWG10) is used. With this filter, new high points are divided by 1.10 to get a reversal signal (RS); new low points are multiplied by 1.10 to get a reversal signal.

The columns are as follows:

- D: Date, day of month.
- H: High price for the day.
- L: Low price for the day.
- C: Closing price.
- RS: Reversal signal.

In practice, a column is usually added for the volume. This has been left out of the example for simplicity. New high figures are put in rectangles, and high reversal signals are also put in rectangles. Low prices and low reversal signals are put in circles.

The procedure on each day is as follows:

1. High, low and closing prices are entered in dollars and eighths.
2. The last entry with a rectangle (high price) or circle (low price) is noted.
 - a. If the current high and low prices are in the range between the prices in the preceding rectangle and circle, no additional entries are required.
 - b. If the current high price is above the last price in a rectangle, the current price is enclosed in a rectangle. This price is divided by 1.10 to get a reversal signal, which is entered in the RS column.
 - c. If the low price is below the last circled price, the current price is put in a circle. It is multiplied by 1.10 to get a reversal signal, which is entered in the RS column.

This procedure is simpler than the explanation. If you will follow the detailed steps through the example, you will agree.

1977-Jan- AH

	D	H	L	C	RS
1					
2					
3	264	257	264	(241)	
4	270	264	264	(244)	
5	270	262	262	(244)	
6	263	257	260		
7	260	257	260		
8					
9					
10	260	255	255		
11	256	250	251		
12	251	(241)	243	264	
13	253	245	245		
14	257	253	255		
15					
16					
17	253	244	247		
18	246	(234)	240	257	
19	250	236	250		
20	253	246	247		
21	252	246	247		
22					
23					
24	250	245	245		
25	253	245	254		
26	261	253	260	(236)	
27	261	254	254	(236)	
28	256	253	254		
29					
30					
31	254	252	253		

The procedure, day by day in the example, follows:

Day:

3: A new high price for the swing is noted. This price, 264, is enclosed by a rectangle. The price is divided by 1.10, to get the reversal signal 241, which is entered and circled.

4: A new high price of 270 is noted. It is enclosed by a rectangle; 270 is divided by 1.10 to get the new reversal signal 244, which is entered and circled.

5: The high price for the previous day is equaled. It is enclosed by a rectangle. Since it is unchanged, the reversal signal is unchanged; it is entered and circled.

6, 7, 10, 11: Prices have been between the previous high (270) and the previous reversal signal (244), so no new reversal signals are required.

12: The low price dropped below the reversal signal. This means that the previous high (270) is now established as a turning point, and can be entered on a chart. The low point of 241 is multiplied by 1.10 to get a new reversal signal. This is entered and put in a rectangle.

13, 14, 17: Prices have been between the low point of 241 and the reversal signal (264).

18: A new low point for the swing is made (234). It is put in a circle, and multiplied by 1.10 to get a new reversal signal (257) which is entered and put in a rectangle.

19, 20, 21, 24, 25: Prices have been between the low point (234) and the reversal signal (257).

26: Prices have pushed through the reversal signal. The high point is put in a rectangle (261). It is divided by 1.10 to get a new reversal signal (236), which is entered in a circle. This reversal establishes 234, on January 18, to be a qualified turning point which can be put on a chart.

27: The high price is equaled, so it is put in a rectangle. The reversal signal is unchanged, so the same figure is entered.

28, 31: Prices have been between the reversal signal (236) and the high point (261); no new reversal signals are required.

Two turning points have been established:

January 5: 270

January 18: 234

The criteria for a complete wave (Chapter 44) have been met, since prices before January were below 234, and rose above 270 in March. The high point of the wave, 270, is 14.9% above 234, so the turning points can be labeled FW14.9.

Appendix II

ARE THE DOW JONES INDUSTRIALS REPRESENTATIVE?

Most of the charts in the appendixes are based on the Dow Jones Industrial average. Is this index representative? It is based on blue chip "top tier" stocks, not on the stocks of small companies.

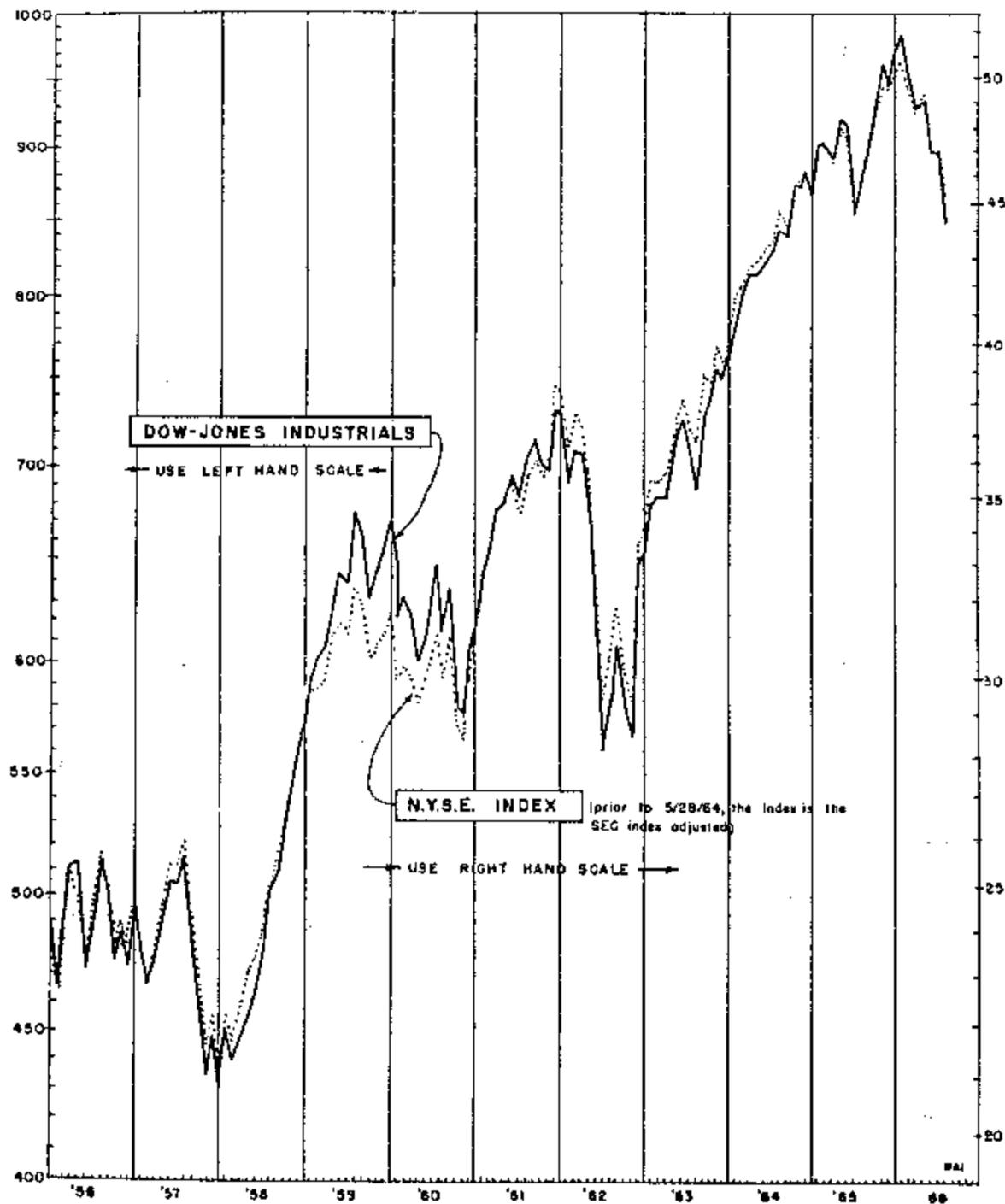
INDEX DESCRIPTION:

In 1896, Charles Dow began to report the averages of a few selected industrial stocks. After 67 years of use, it is still the most widely-quoted measure, although a number of very sophisticated indexes have entered the field.

Twelve industrial stocks were used until 1916, when the list was increased to 20, and the new average was worked back to December 1914. Only the closing averages were calculated. The method was simple. The stock prices were listed and divided by the number of stocks to get an average. If a stock split, a multiple was applied before adding with the others; if the split were two-for-one, for example, the stock price after the split was always multiplied by two before combining with the other prices.

On October 1, 1928, a number of changes were made. The number of industrial stocks was increased to 30 (the current number); the closing prices were supplemented by calculation of the highest and lowest averages for each day, and the method of coping with splits was altered. The multiples were eliminated, and the adjustment was made in the final divisor. The divisor was also adjusted when a new stock was substituted for another in the list, in order to give continuity.

To calculate the current average, list the stocks (you will find them occasionally in Barron's and the Wall Street Journal). Set down the prices; add them up; divide by the divisor (See Barron's or the Wall Street Journal.); the result is the index.



INDEX LIMITATIONS:

(1) Representation: The index is based on the stock prices of only thirty large companies. It is an important list, however. If you total the market value of the 30 stocks (multiply the price by the number of shares listed), you will find that this small group of companies has more than one third the value of all stocks listed on the New York Stock Exchange. But the small stocks aren't included; does the Dow represent the total? Note the chart opposite, which compares the Dow Industrials with the all-inclusive New York Stock Exchange index. I think you will agree that the Dow does a good job.

Of course, the New York Exchange index also weights the stocks by their capitalization. But isn't this reasonable? General Electric is certainly found in more portfolios than the stock of Federal Signal Corp.; shouldn't it be given more weight in a price index?

(2) Price level: A minor irritation is the high price of the Dow Jones Industrials. \$900 is a number that can be misleading. A nine point change sounds big, but it is only 1%. If this irritation disturbs you, divide the index and its changes by ten before interpreting.

(3) A more serious objection is levelled at the high-low calculation. These are not highs and lows for the index; instead they are averages calculated from the individual stocks in the index. Since these highs and lows occur at different times in the day, the index never drops to the "low" and never achieves the "high."

(4) Weighting: Statisticians wince when they learn the D-J weighting method. In a representative average, each stock should be weighted by a rational method, so that its importance in the index is properly reflected by the index. In the D-J, the weighting is the price. Exxon has more than three times the capitalization of Dupont; Dupont, because of high price, has more than twice the weight of Exxon in the index.

The lack of logic in the weighting method is evident at the time of a stock split. If a D-J stock is split four-for-one, the importance of the stock in the index (if this influence is measured by the effect of a 10% change in price) is reduced to one-quarter of its importance before the split. The true importance of the company, of course, hasn't been changed by the split.

It should be noted that lower-priced stocks are usually more volatile. This characteristic helps the "Dow." The change of one dollar in the price of each stock in the index carries equal weight. It is easier for a hundred dollar stock to move one dollar than for a \$20 stock. However, it's easier for a \$20 stock to change 5% than for a \$100 stock. This characteristic balances some of the illogical weighting after a stock split.

The conclusion: The Dow has many faults, but it is quite useful, and it does a surprisingly good job.

Appendix III

HISTORICAL CHARTS -- BULL AND BEAR MARKETS

Bull and Bear Markets have been defined by the use of a 30% filter (FWG30). This is discussed in Chapter 8. The fifteen bull markets since 1898 form the first group of charts, arranged in chronological order. The fifteen bear markets follow.

For each bull and bear market, there are three items:

1. Tabulation of data
2. Chart using 5% filter (FWG5)
3. Chart using 10% filter (FWG10)

COLUMN HEADS IN TABLES:

FW: This is the measure of each turning point, to one decimal place. It is the filter size which can eliminate the turning point (see Chapter 5). This column will help you to locate each turning point on the graphic charts, for the latter are labeled with the FW number.

Date: The dates for all turning points are noted. In addition, a few dates are added in parentheses. The latter are the trading days near a few selected historical events.

Day: The day of the week may be interesting in some analyses.

DJI: Closing D-J averages were used prior to 1932; hourly figures were used after that date. Averages prior to a revision of the index in 1914 have been multiplied by 0.7297, to make them comparable.

FW: This is the FW carried to an additional decimal point, to give additional accuracy in some analyses. If you would like to chart points above a certain filter size, use this column and ignore all turning points with a lower FW.

Days: The calendar days elapsed since the last terminal point.

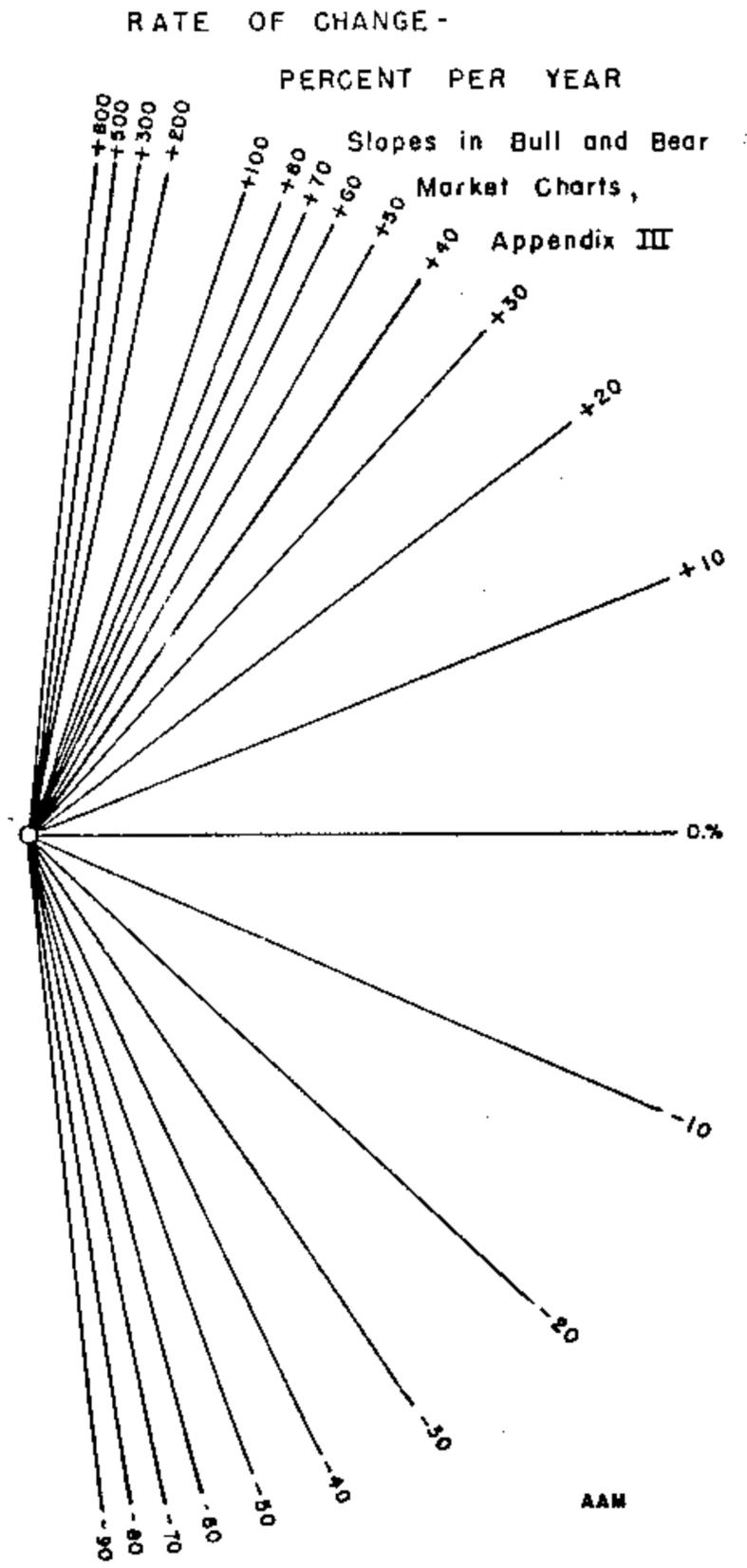


CHART SCALES

A logarithmic scale is used for these charts. This means that, on any chart, a given percentage is the same vertical distance. For example, the distance from 100 to 110 is the same as the distance from 200 to 220, or from 400 to 440.

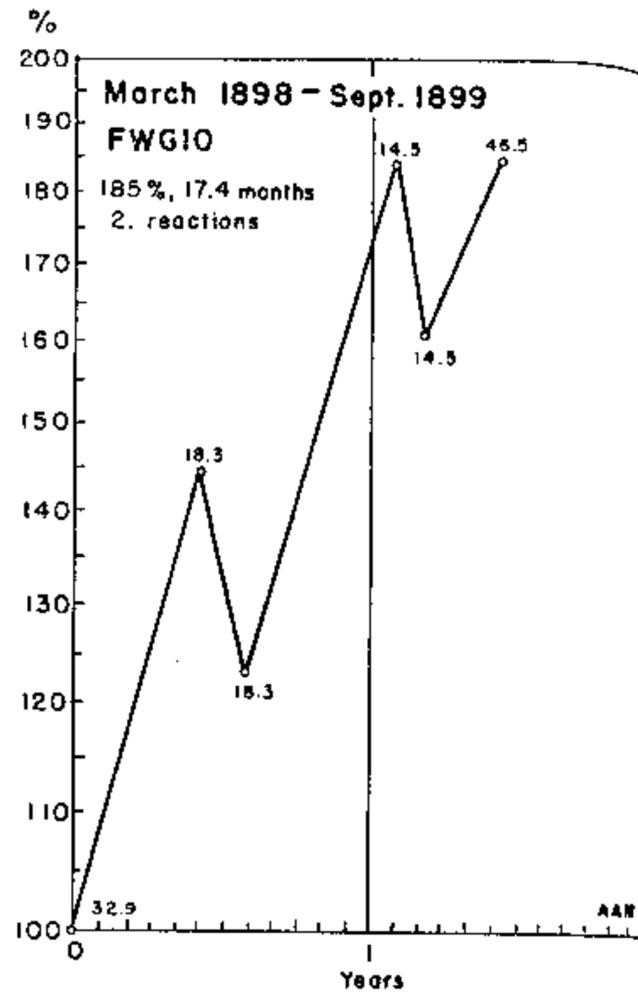
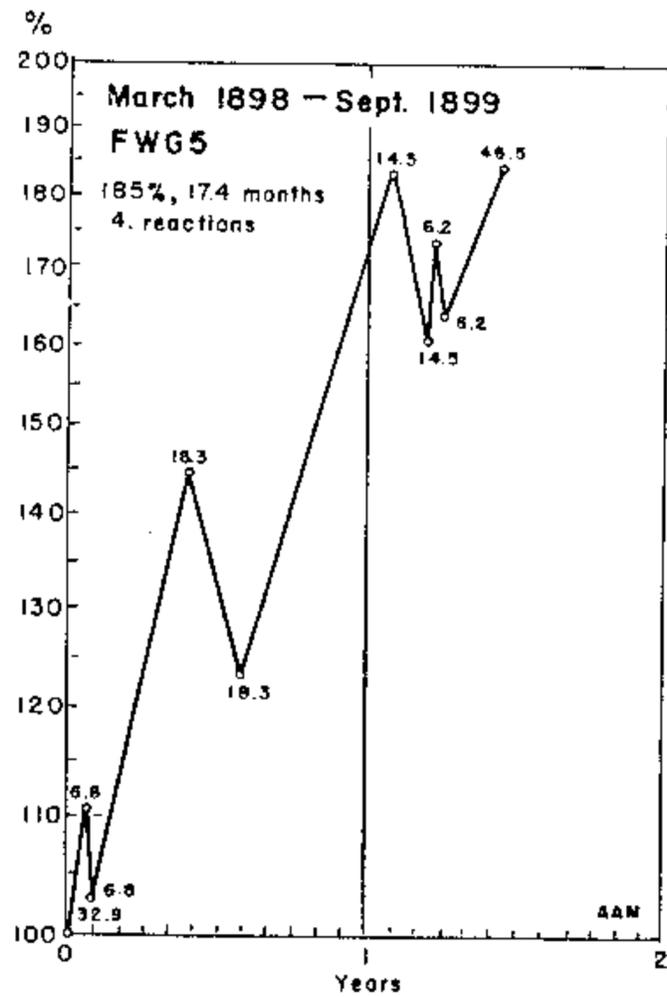
To make the charts comparable, they all start at 100.

The horizontal scale is in years.

Since growth is a geometric function, a logarithmic scale is required for a true trend line. A straight line of a certain slope has the same growth rate, in percent per year, no matter where the line is drawn. To determine this growth rate, you can use the chart opposite, or the following formulae: (Θ = angle between the trend line and horizontal)

Rising trend:
 Percent per year growth = $100 \cdot \log^{-1}[(\tan. \Theta)/9.77] - 100.$

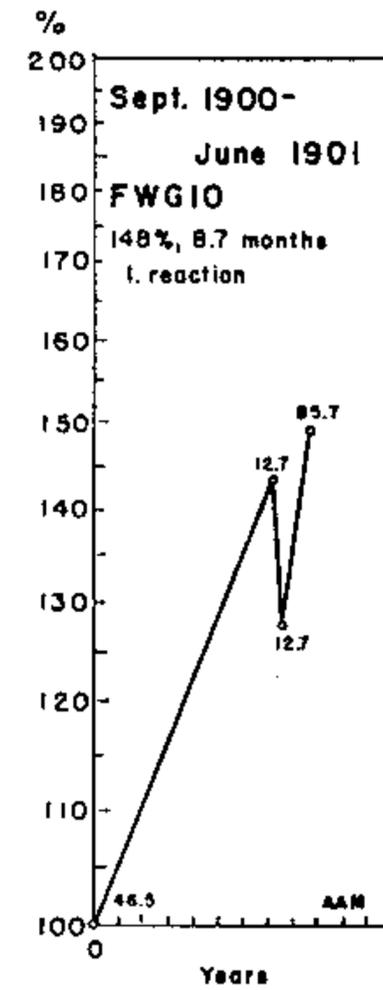
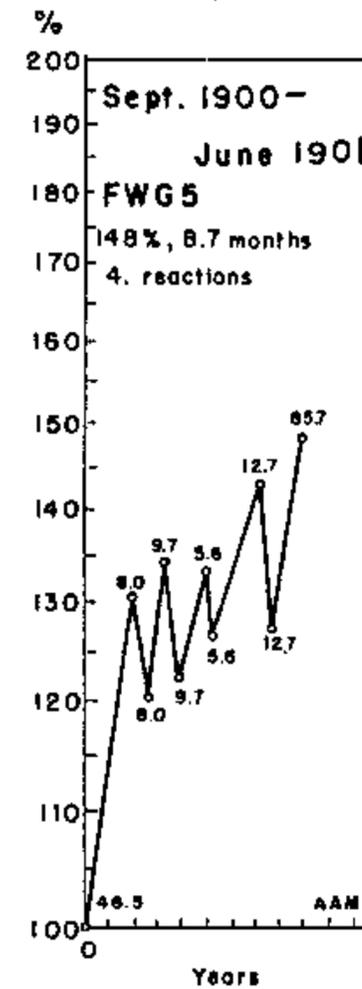
Declining trend:
 Decline rate in percent per year
 = $100 - 10 \cdot \log^{-1}[1. - (\tan. \Theta)/9.77]$



BULL MARKET

25 March 1898 - 5 September 1899

FW	Date	Day	DJI	FW	Days	
32.9	3/25/98	F	30.65	32.90	9	Bull market begins
6.8	4/12/98	Tu	33.80	6.80	18	
6.8	4/21/98	Th	31.57	6.80	9	
	(4/23/98)	Sa	32.51)			
	(4/24/98)	Su	closed)			Spain declares war
	(4/25/98)	M	32.12)			
	(4/30/98)	Sa	33.57)			
	(5/1/98)	Su	closed)			Dewey destroys Spanish fleet
	(5/2/98)	M	35.46)			
	(7/25/98)	M	39.16)			
	(7/26/98)	Tu	39.53)			Spain asks for terms
	(7/27/98)	W	39.24)			
18.3	8/26/98	F	44.49	18.25	127	
18.3	10/19/98	W	37.62	18.25	54	
14.5	4/25/99	Tu	56.39	14.47	188	
14.5	5/31/99	W	49.26	14.47	36	
6.2	6/12/99	M	53.33	6.16	12	
6.2	6/22/99	Th	50.23	6.16	10	
46.5	9/5/99	Tu	56.63	46.54	75	Bear mkt. begins



BULL MARKET

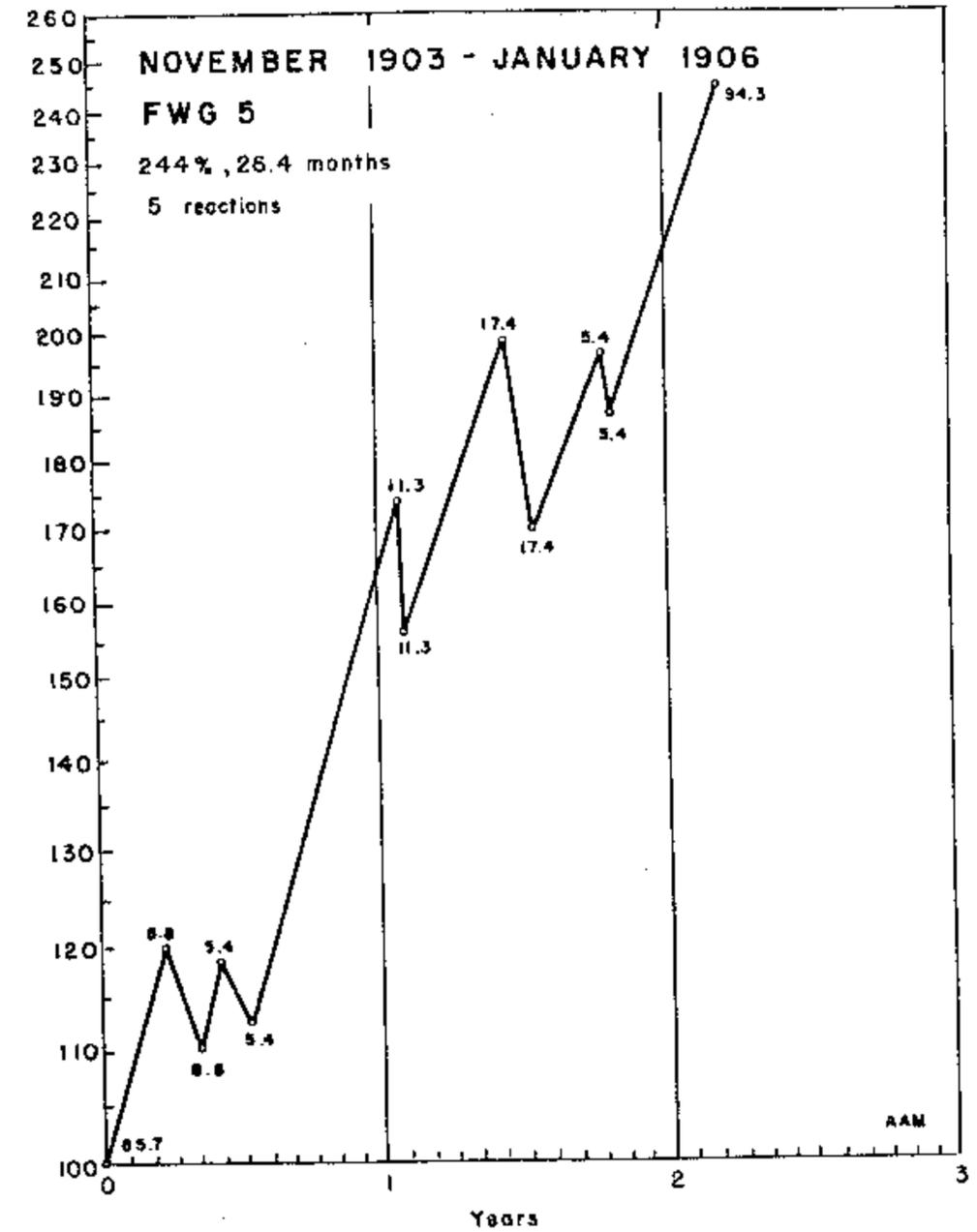
24 September 1900 - 17 June 1901

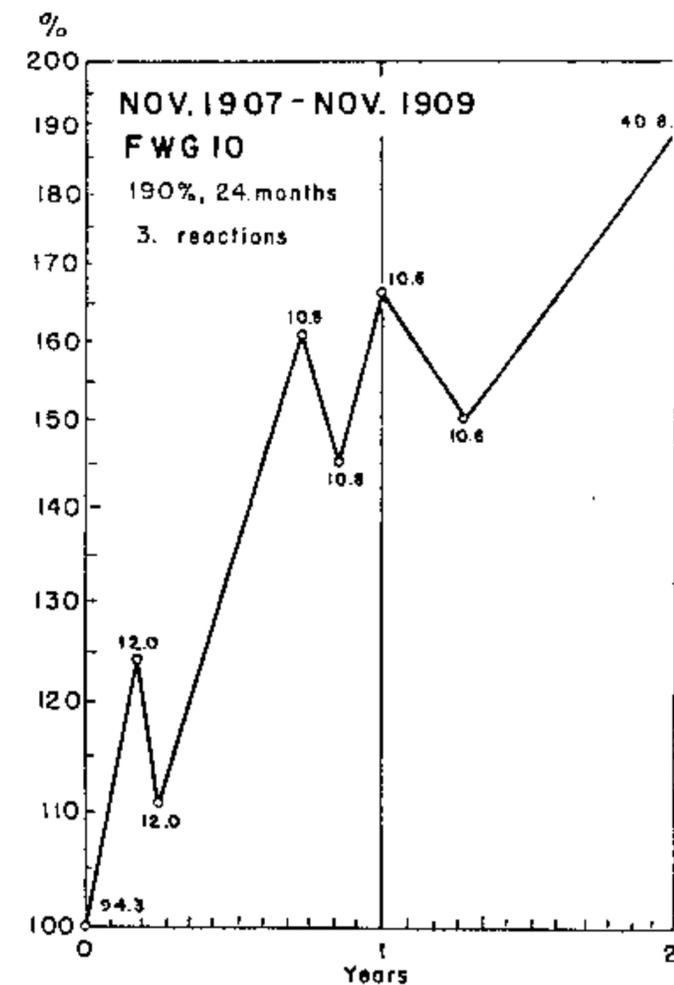
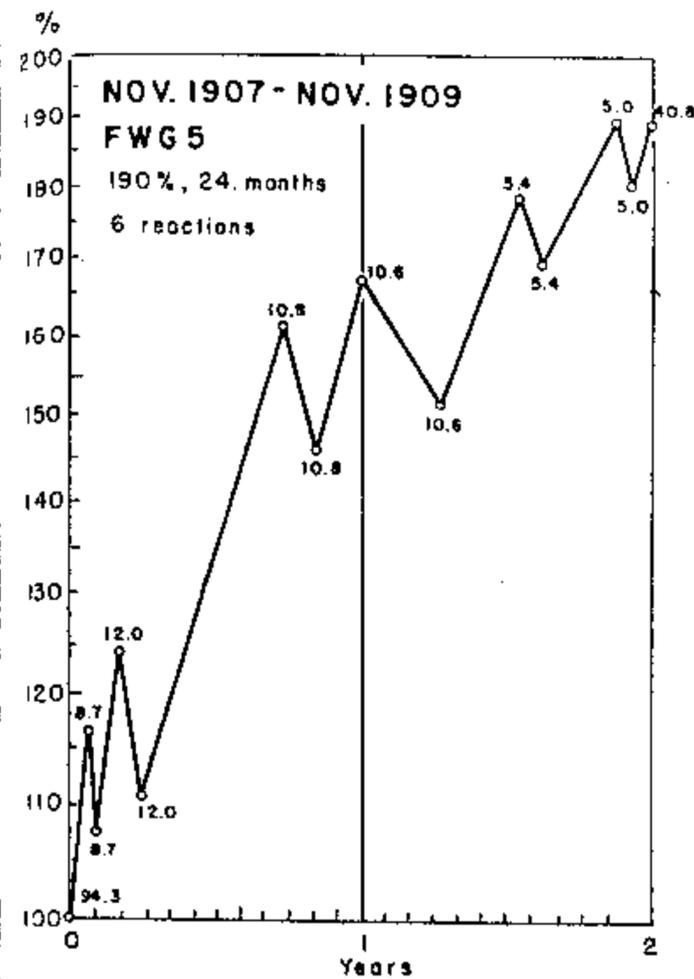
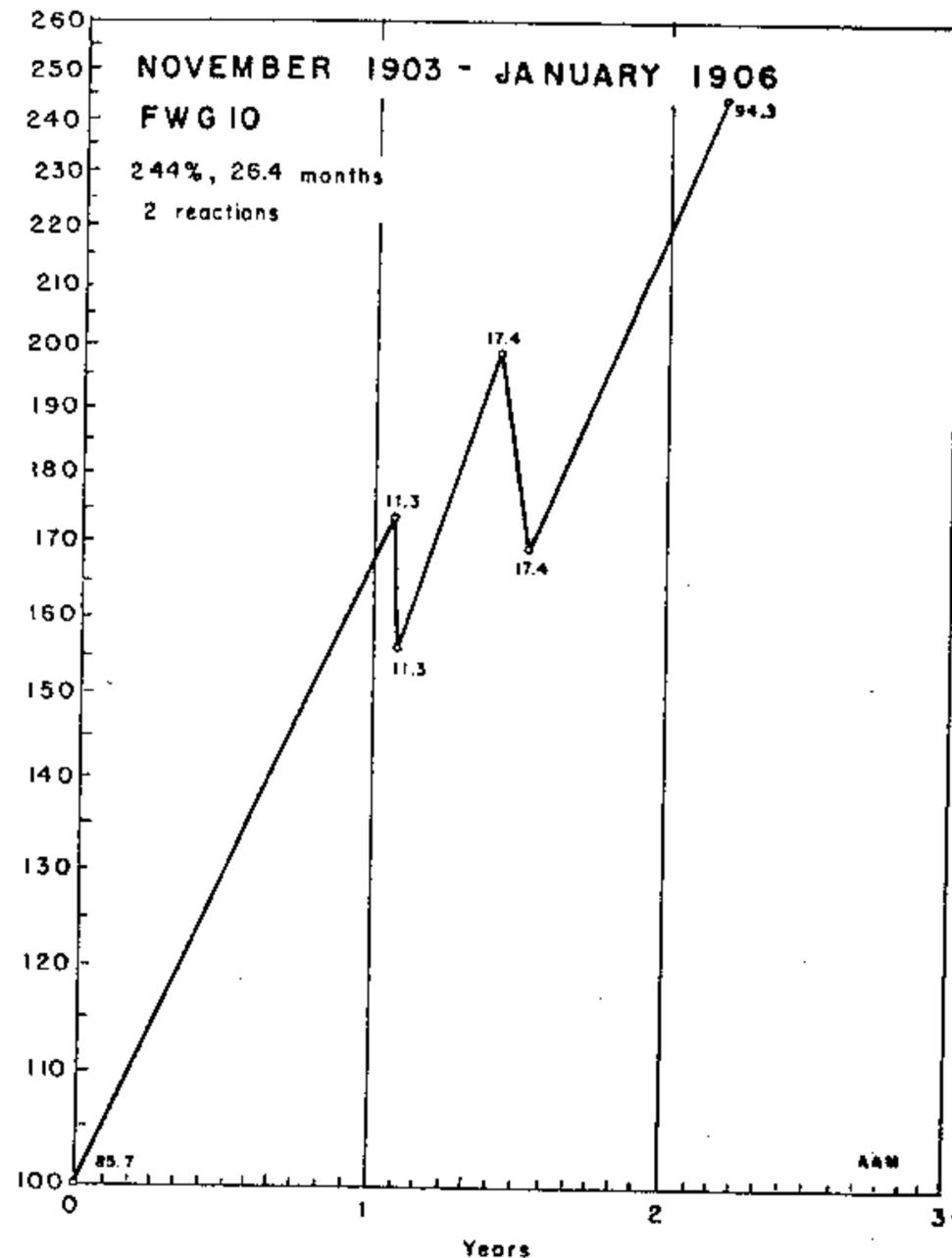
FW	Date	Day	DJI	FW	Days	
46.5	9/24/00	M	38.64	46.54	63	bull market begins
8.0	11/20/00	Tu	50.40	7.96	57	
8.0	12/8/00	Sa	46.69	7.96	18	
9.7	12/27/00	Th	51.84	9.68	19	
9.7	1/19/01	Sa	47.26	9.68	23	
5.6	2/15/01	F	51.65	5.64	27	
5.6	2/28/01	Th	48.89	5.64	13	
12.7	5/1/01	W	55.41	12.69	62	
	(5/8/01)	W	52.33)			
12.7	5/9/01	Th	49.17	12.69	8	← Northern Pacific cornered-
	(5/10/01)	F	52.30)			price up from 160 to 1000 in one hour -
85.7	6/17/01	M	57.11	85.67	39	← Bear market begins

BULL MARKET

9 November 1903 - 19 January 1906

FW	Date	Day	DJI	FW	Days	
85.7	11/9/03	M	30.76	85.67	13	Bull market begins
8.8	1/27/04	W	36.85	8.81	79	
	(2/6/04)	Sa	34.77			
	(2/8/04)	M	35.10			←Japanese fleet attacks Russia at Port Arthur
	(2/9/04)	Tu	34.28			
8.8	3/12/04	Sa	33.87	8.81	45	
5.4	4/7/04	Th	36.47	5.38	26	
5.4	5/18/04	W	34.61	5.38	41	
11.3	12/5/04	M	53.44	11.34	201	
11.3	12/12/04	M	47.99	11.34	7	
17.4	4/14/05	F	61.11	17.35	123	
17.4	5/22/05	M	52.08	17.35	38	
5.4	8/23/05	W	60.43	5.37	93	
5.4	9/7/05	Th	57.35	5.37	15	
94.3	1/19/06	F	75.16	94.34	134	Bear market begins





BULL MARKET

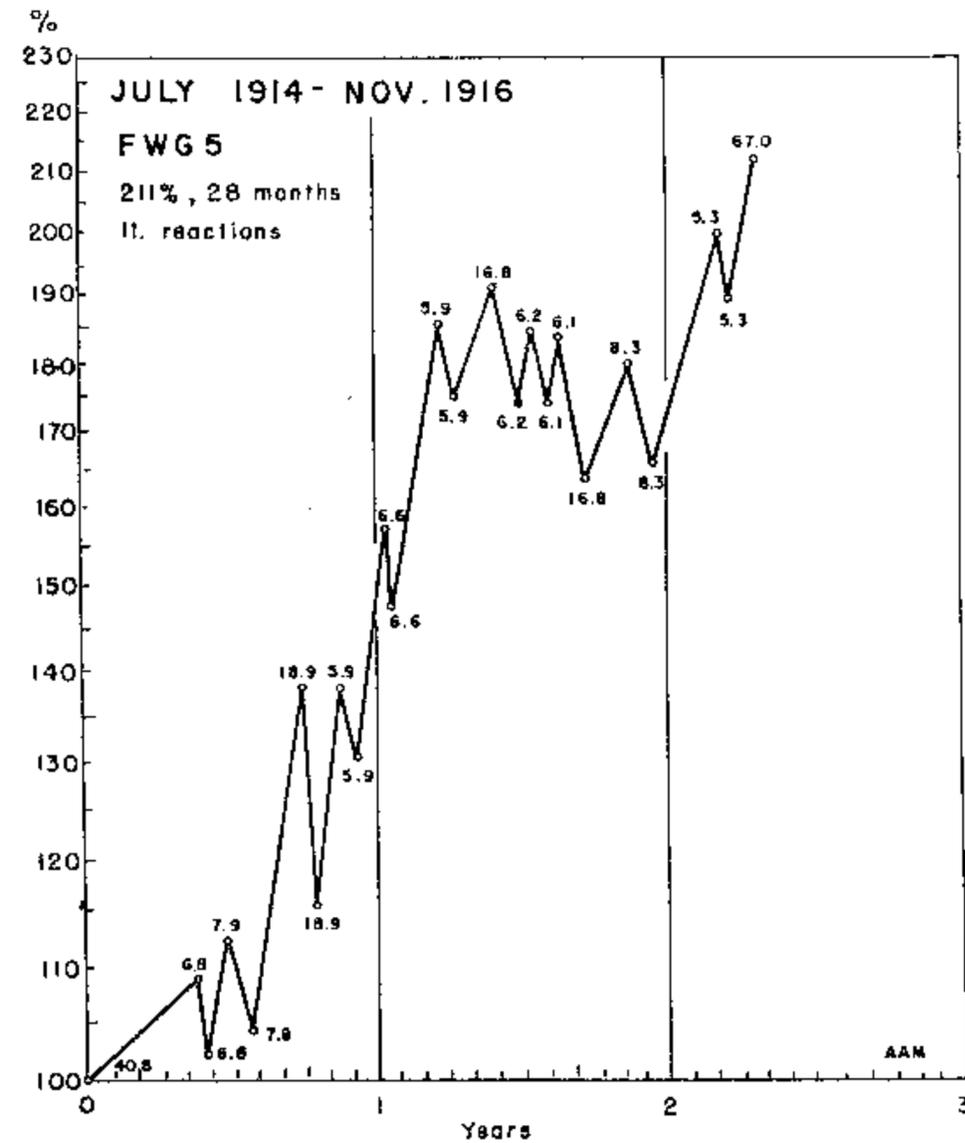
15 November 1907 - 19 November 1909

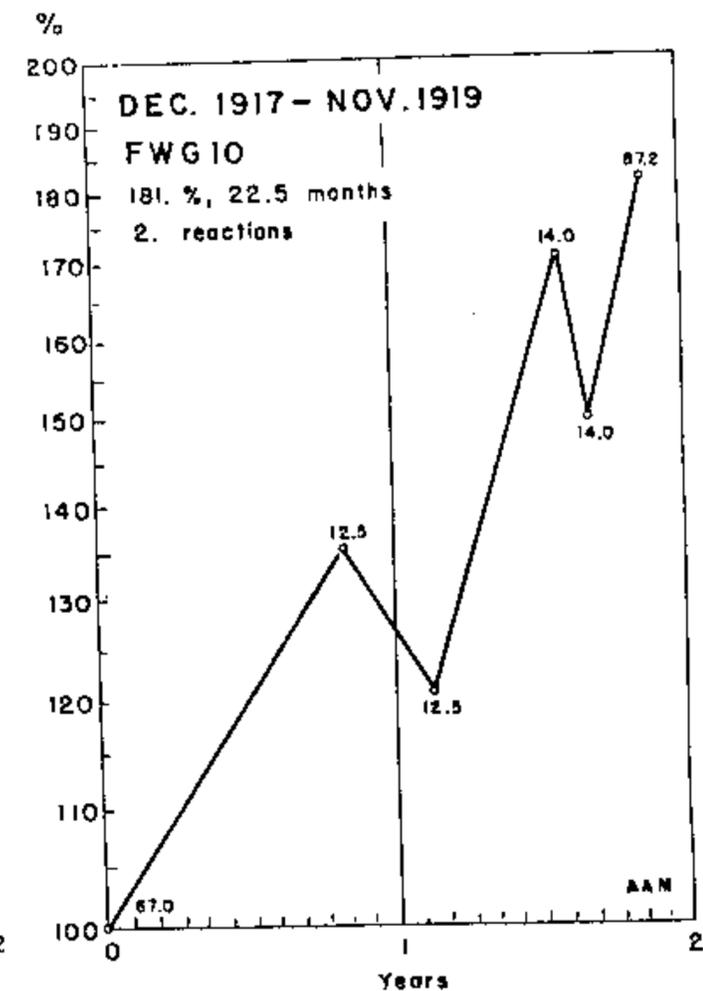
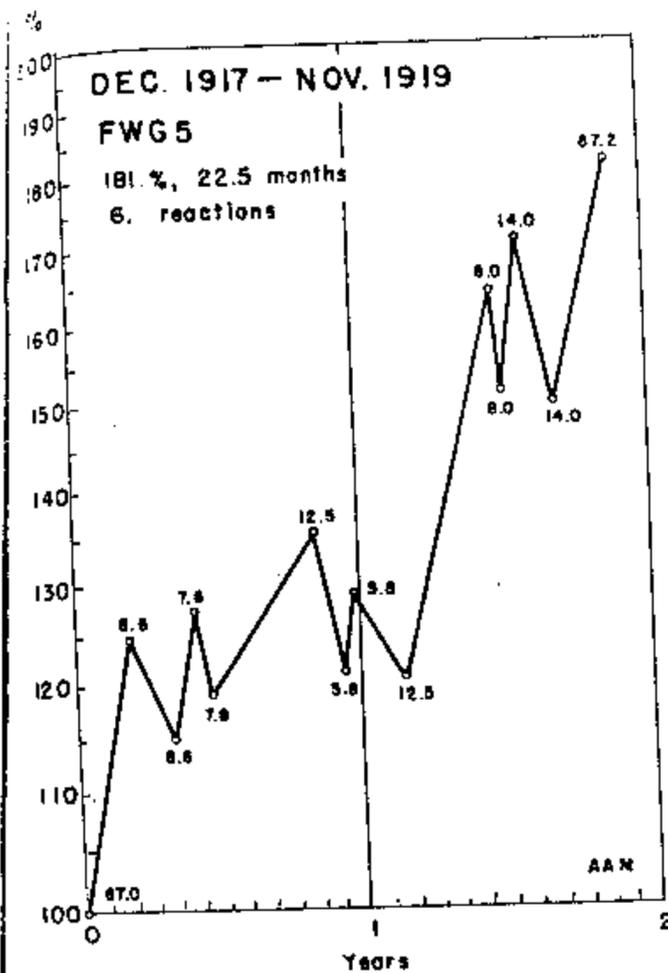
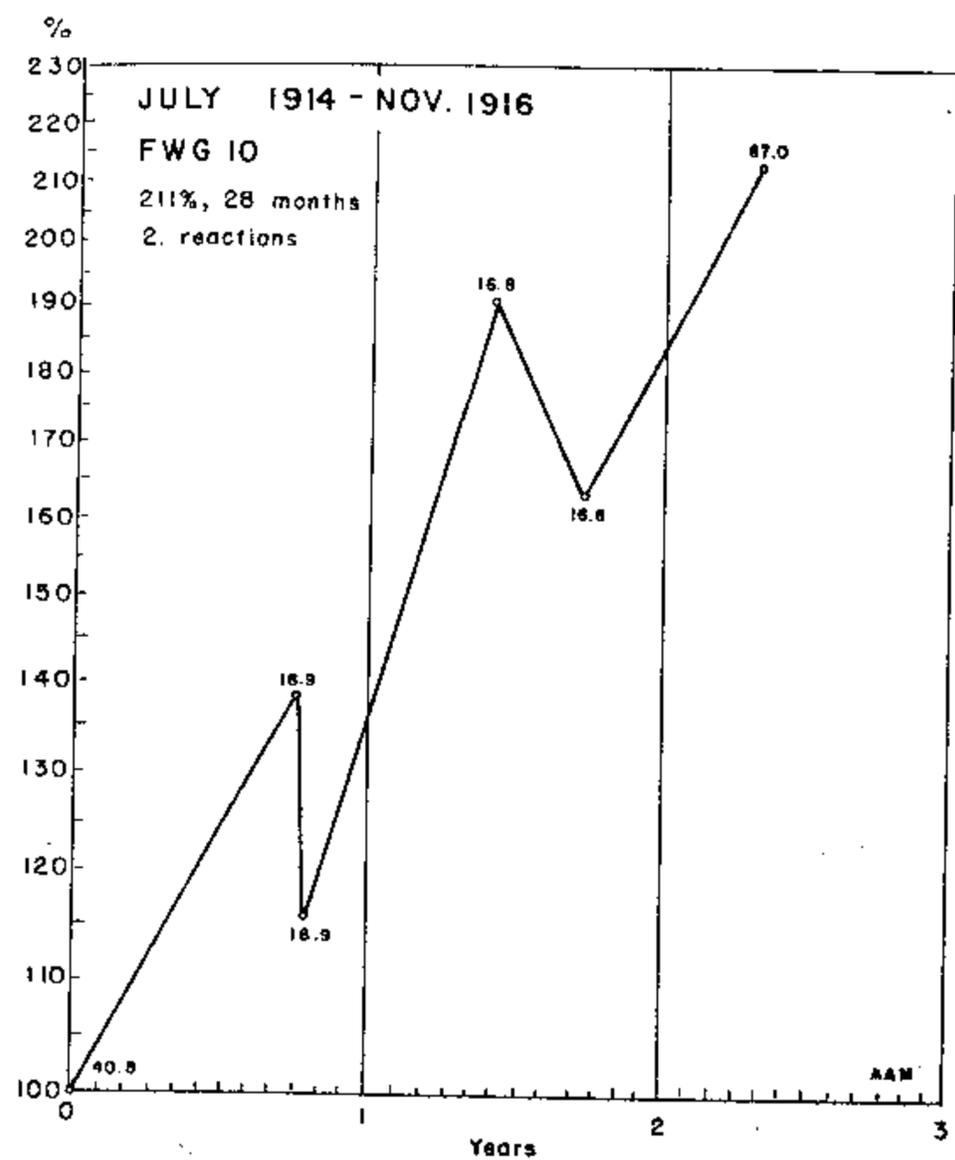
FW	Date	Day	DJI	FW	Days	
94.3	11/15/07	F	38.67	94.34†	70	Bull market begins
8.7	12/6/07	F	45.07	8.65	21	
8.7	12/17/07	Tu	41.48	8.65	11	
12.0	1/14/08	Tu	48.04	11.97	28	
12.0	2/10/08	M	42.91	11.97	27	
10.8	8/10/08	M	62.32	10.81	182	
10.8	9/22/08	Tu	56.24	10.81	43	
10.6	11/13/08	F	64.49	10.60	52	
10.6	2/23/09	Tu	58.31	10.60	102	
5.4	6/5/09	Sa	68.93	5.35	102	
5.4	6/21/09	M	65.42	5.35	16	
5.0	10/2/09	Sa	73.33	5.02	103	
5.0	10/23/09	Sa	69.83	5.02	21	
40.8	11/19/09	F	73.36	40.76†	27	Bear Market begins

BULL MARKET

30 July 1914 - 21 November 1916

FW	Date	Day	DJI	FW	Days	Notes
40.8	7/30/14	Th	52.12	40.76	↑ 50	Bull market begins
	(7/31/14)	F				closed) Exchange closes - war
	(8/1/14)	Sa				closed) Germany declares war on Russia
	(8/3/14)	M				closed) Germany declares war on France
	(12/12/14)	Sa	54.62			Exchange reopens
6.8	12/14/14	M	56.76	6.75	137	
6.8	12/24/14	Th	53.17	6.75	10	
7.9	1/23/15	Sa	58.52	7.93	30	
7.9	2/24/15	W	54.22	7.93	32	
18.9	4/30/15	F	71.78	18.88	65	
	(5/6/15)	Th	68.23			
	(5/7/15)	F	65.13			← Lusitania sunk by German submarine
	(5/8/15)	Sa	62.77			
18.9	5/14/15	F	60.38	18.88	14	
5.9	6/22/15	Tu	71.90	5.92	39	
5.9	7/9/15	F	67.88	5.92	17	
6.6	8/18/15	W	81.86	6.64	40	
6.6	8/21/15	Sa	76.76	6.64	3	
5.9	10/22/15	F	96.46	5.91	62	
5.9	11/9/15	Tu	91.08	5.91	18	
16.8	12/27/15	M	99.21	16.77	↓ 48	
6.2	1/31/16	M	90.58	6.15	35	
6.2	2/11/16	F	96.15	6.15	11	
6.1	3/2/16	Th	90.52	6.14	20	
6.1	3/16/16	Th	96.08	6.14	14	
16.8	4/22/16	Sa	84.96	16.77	↑ 37	
8.3	6/12/16	M	93.61	8.32	51	
8.3	7/13/16	Th	86.42	8.32	32	
5.3	10/5/16	Th	104.15	5.27	83	
5.3	10/13/16	F	98.94	5.27	8	
67.0	11/21/16	Tu	110.15	67.02	↓ 39	Bear Market begins





BULL MARKET

19 December 1917 - 3 November 1919

FW	Date	Day	DJI	FW	Days	
67.0	12/19/17	W	65.95	67.02↑	26	Bull Market begins
8.6	2/19/18	Tu	82.08	8.60	62	
8.6	4/11/18	Th	75.58	8.60	51	
7.8	5/15/18	W	84.04	7.84	34	
7.8	6/1/18	Sa	77.93	7.84	17	
12.5	10/18/18	F	89.07	12.53↓	139	
	(11/9/18)	Sa	88.06			
	(11/11/18)	M	closed			Armistice signed
	(11/12/18)	Tu	86.56			
5.8	11/25/18	M	79.87	5.80	38	
5.8	12/10/18	Tu	84.50	5.80	15	
12.5	2/8/19	Sa	79.15	12.53↑	60	
8.0	6/5/19	Th	107.55	8.03	117	
8.0	6/16/19	M	99.56	8.03	11	
14.0	7/14/19	M	112.23	13.99	28	
14.0	8/20/19	W	98.46	13.99	37	
87.2	11/3/19	M	119.62	87.20↓	75	Bear Market begins

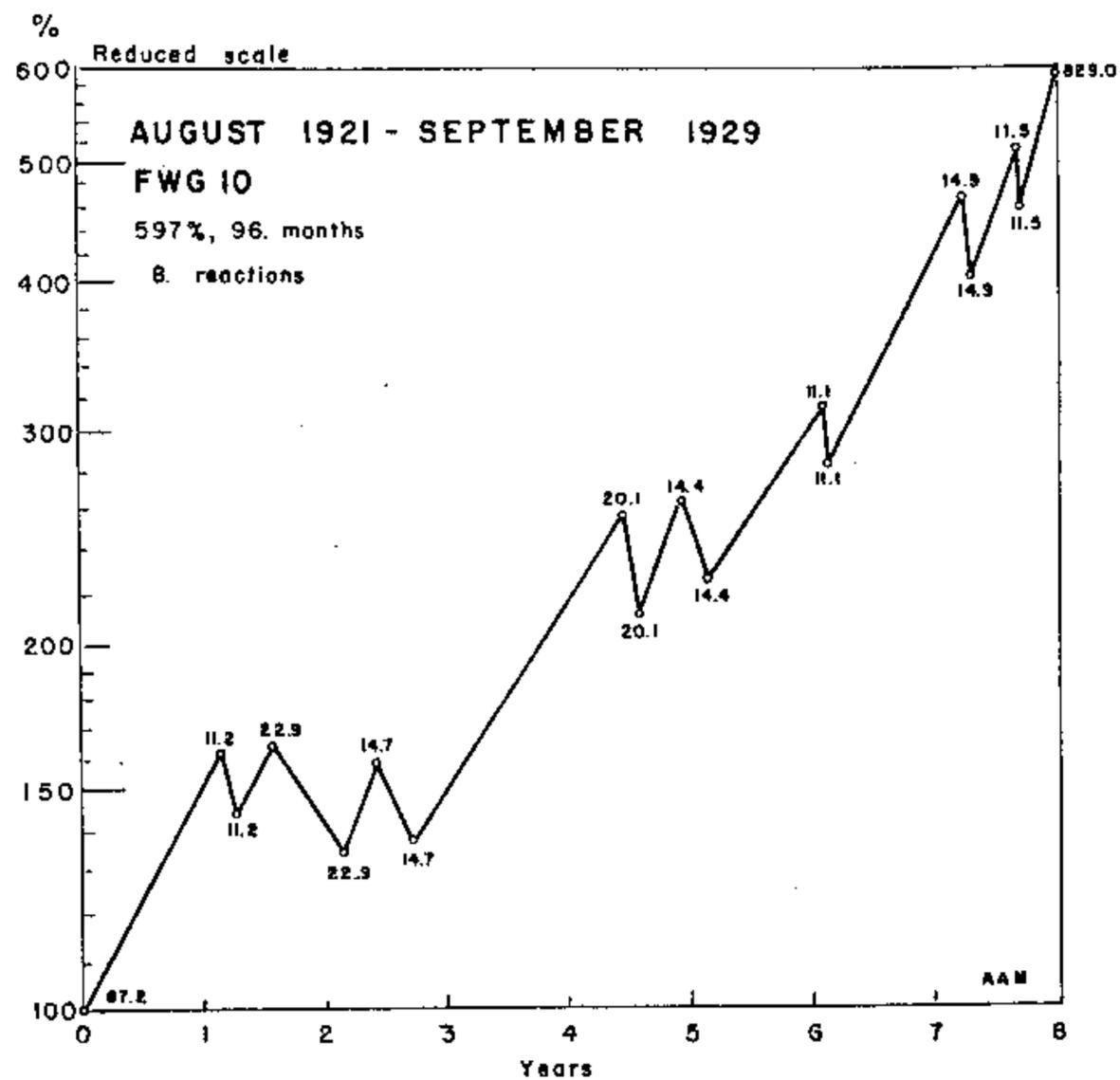
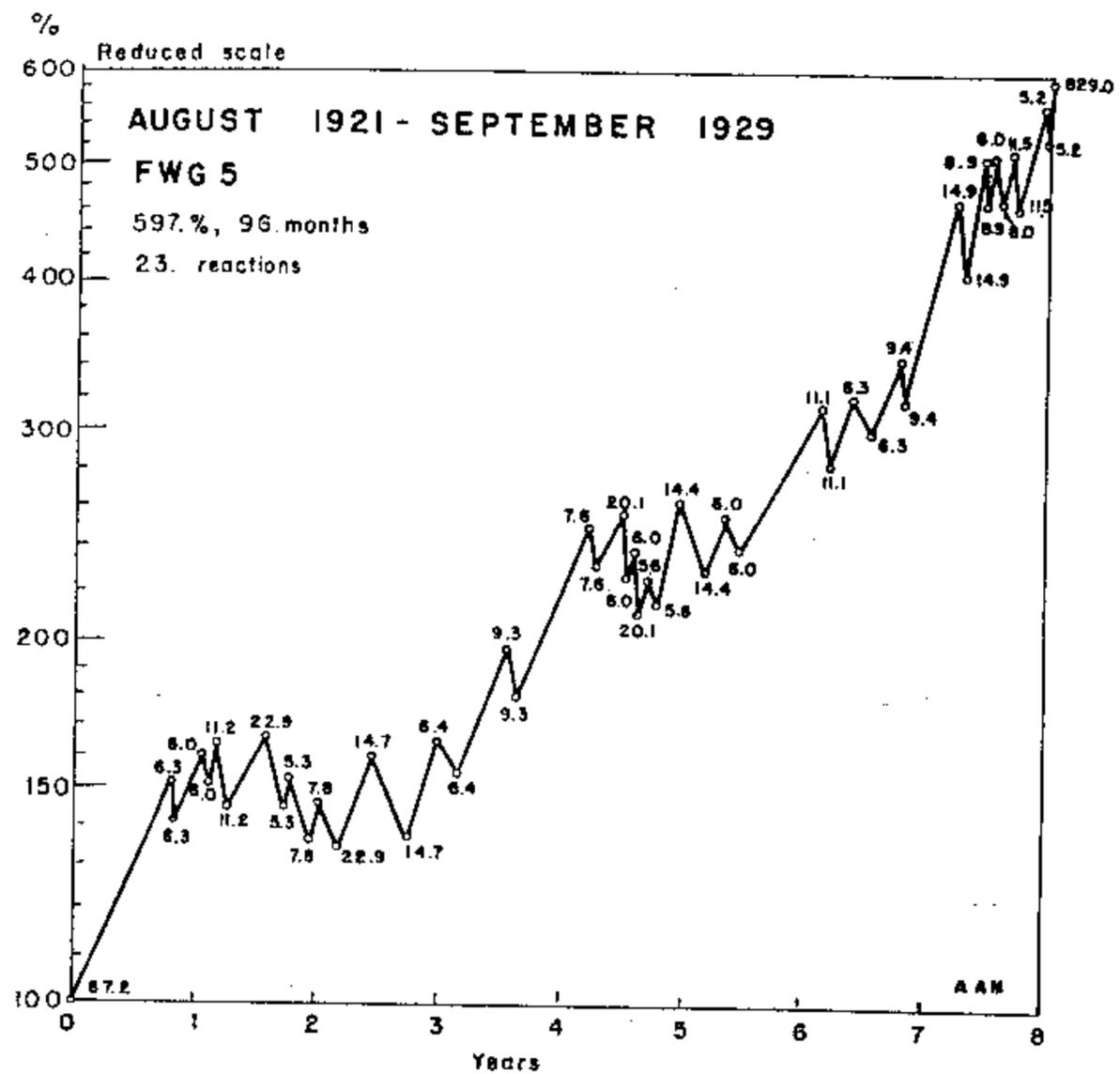
BULL MARKET

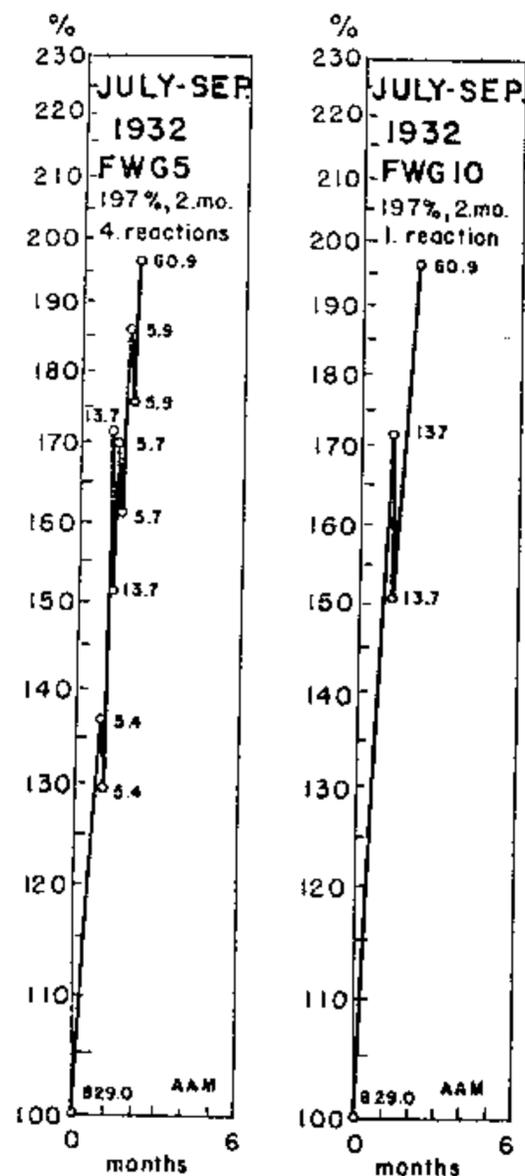
24 August 1921 - 3 September 1929

FW	Date	Day	DJI	FW	Days	
87.2	8/24/21	W	63.90	87.20	22	Bull market begins
6.3	5/29/22	M	96.41	6.26	278	
6.3	6/12/22	M	90.73	6.26	14	
6.0	9/11/22	M	102.05	5.97	91	
6.0	9/30/22	Sa	96.30	5.97	19	
11.2	10/14/22	Sa	103.43	11.24	14	
11.2	11/27/22	M	92.03	11.24	44	
22.9	3/20/23	Tu	105.38	22.88	113	
5.3	5/21/23	M	92.77	5.27	62	
5.3	5/29/23	Tu	97.66	5.27	8	
7.8	7/31/23	Tu	86.91	7.81	63	
	(8/1/23	W	87.96)			
	(8/2/23	Th	88.20)			Harding death
	(8/3/23	F	closed)			
	(8/4/23	Sa	87.20)			
7.8	8/29/23	W	93.70	7.81	29	
22.9	10/27/23	Sa	85.76	22.88	59	
14.7	2/6/24	W	101.31	14.69	102	
14.7	5/20/24	Tu	88.33	14.69	104	
6.4	8/20/24	W	105.27	6.44	92	
6.4	10/14/24	Tu	99.18	6.44	55	
9.3	3/6/25	F	125.68	9.29	143	
9.3	3/30/25	M	115.00	9.29	24	
7.6	11/6/25	F	159.39	7.57	221	

Bull Market 1921-1929 continued:

FW	Date	Day	DJI	FW	Days	
7.6	11/24/25	Tu	148.18	7.57	18	
20.1	2/11/26	Th	162.31	20.05	79	
6.0	3/3/26	W	144.44	6.02	20	Rhea: "Hamilton's one big
6.0	3/10/26	W	153.13	6.02	7	mistake - he called
20.1	3/30/26	Tu	135.20	20.05	20	this a bear market."
5.6	4/24/26	Sa	144.83	5.59	25	
5.6	5/19/26	W	137.16	5.59	25	
14.4	8/14/26	Sa	166.64	14.40	87	
14.4	10/19/26	Sa	145.66	14.40	66	
6.0	12/18/26	Sa	161.86	5.98	60	
6.0	1/25/27	Tu	152.73	5.98	38	
11.1	10/3/27	M	199.78	11.12	251	
11.1	10/22/27	Sa	179.78	11.12	19	
6.3	1/3/28	Tu	203.35	6.28	73	
6.3	2/20/28	M	191.33	6.28	48	
9.4	6/2/28	Sa	220.96	9.41	103	
9.4	6/18/28	M	201.96	9.41	16	
14.9	11/28/28	W	295.62	14.88	163	
14.9	12/8/28	Sa	257.33	14.88	10	
8.9	2/5/29	Tu	322.06	8.86	59	
8.9	2/16/29	Sa	295.85	8.86	11	
8.0	3/1/29	F	321.18	7.96	13	
8.0	3/25/29	M	297.50	7.96	24	
11.5	5/4/29	Sa	327.08	11.47	40	
11.5	5/27/29	M	293.42	11.47	23	
5.2	8/3/29	Sa	355.62	5.22	68	
5.2	8/9/29	F	337.99	5.22	6	
829.0	9/3/29	Tu	381.17	829.00	25	Bear Market begins





BULL MARKET

8 July 1932 - 8 September 1932

FW	Date	Day	DJI	FW	Days	
829.0	7/8/32	F	41.03	829.00 ↑	22	Bull market begins
5.4	8/1/32	M	55.98	5.44	24	
5.4	8/3/32	W	53.09	5.44	2	
13.7	8/11/32	Th	70.40	13.73	8	
13.7	8/13/32	Sa	61.90	13.73	2	
5.7	8/17/32	W	69.81	5.66	4	
5.7	8/18/32	Th	66.07	5.66	1	
5.9	8/29/32	M	76.21	5.89	11	
5.9	8/31/32	W	71.97	5.89	2	
60.9	9/8/32	Th	80.68	60.85 ↓	8	Bear market begins

Just two months - but prices almost doubled!

BULL MARKET

27 February 1933 - 6 March 1937

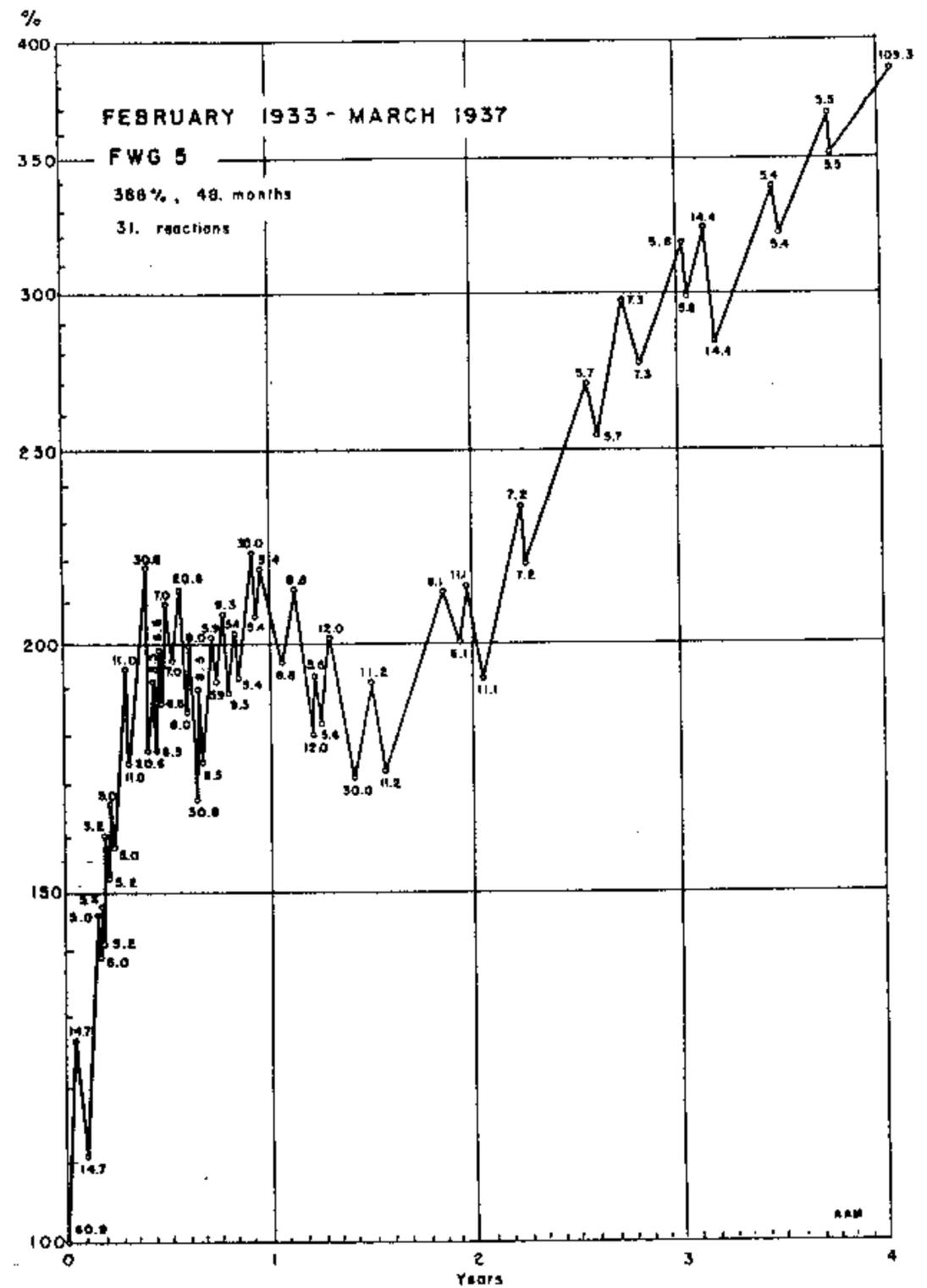
FW	Date	Day	DJI	FW	Days	
60.9	2/27/33	M	50.16	60.85	18	Bull Market begins
	(3/3/33)	F	53.84			← Roosevelt orders banks closed and gold embargo
	(3/6/33)	M				closed) ← Bank moratorium lifted.
	(3/13/33)	M				
	(3/15/33)	W	62.10			
14.7	3/16/33	Th	63.48	14.67	17	
14.7	4/4/33	Tu	55.36	14.67	19	
5.0	4/20/33	Th	73.04	5.02	16	
5.0	4/22/33	Sa	69.55	5.02	2	
5.2	4/24/33	M	73.89	5.23	2	
5.2	4/28/33	F	70.92	5.23	4	
5.2	5/5/33	F	80.27	5.19	7	
5.2	5/9/33	Tu	76.31	5.19	4	
5.0	5/17/33	W	83.43	5.02	8	
5.0	5/22/33	M	79.44	5.02	5	
11.0	6/13/33	Tu	97.17	10.95	22	
11.0	6/16/33	F	87.58	10.95	3	
30.8	7/18/33	Tu	109.43	30.83 ↓	32	
20.6	7/22/33	Sa	88.42	20.63 ↓	4	
8.5	7/27/33	Th	96.11	8.49	5	
8.5	7/31/33	M	88.59	8.49	4	
6.6	8/10/33	Th	99.53	6.64	10	
6.6	8/16/33	W	93.33	6.64	6	
7.0	8/25/33	F	105.07	6.95	9	
7.0	9/6/33	W	98.24	6.95	12	
20.6	9/18/33	M	106.66	20.63 ↑	12	
8.0	10/3/33	Tu	92.47	8.01	15	
8.0	10/10/33	Tu	99.88	8.01	7	
30.8	10/21/33	Sa	83.64	30.83 ↑	11	
8.5	10/25/33	W	94.55	8.45	4	
8.5	10/31/33	Tu	87.18	8.45	6	
5.9	11/21/33	Tu	101.41	5.89	21	
5.9	11/27/33	M	95.77	5.89	6	
9.3	12/11/33	M	103.36	9.31	14	
9.3	12/20/33	W	94.56	9.31	9	

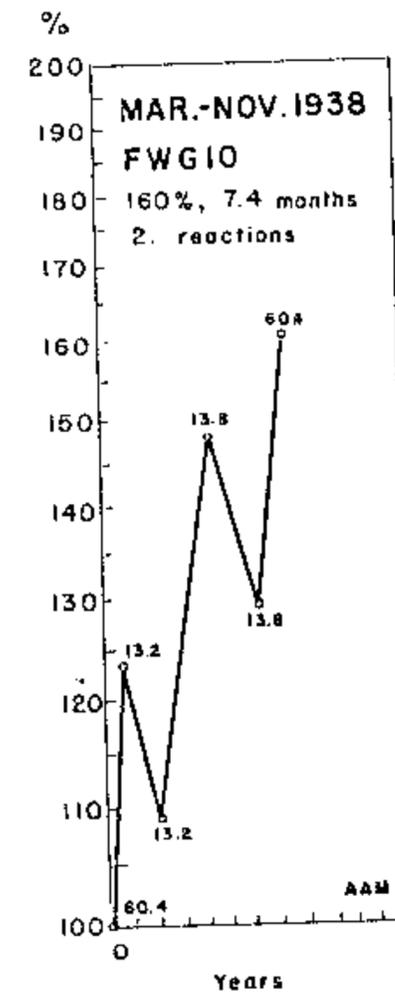
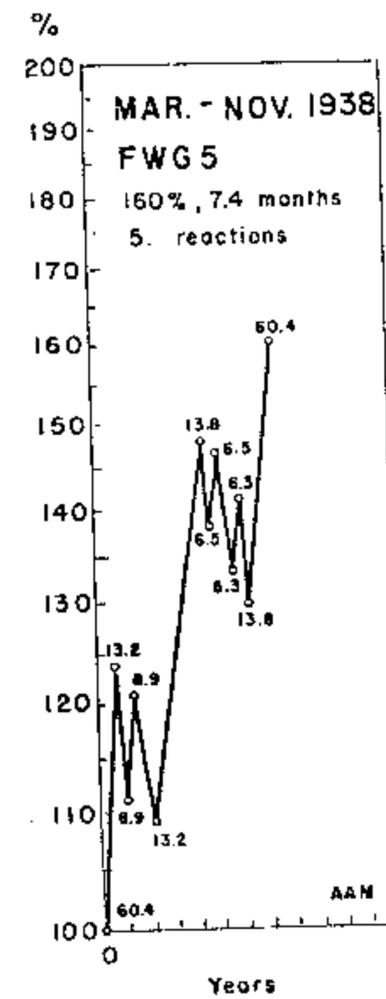
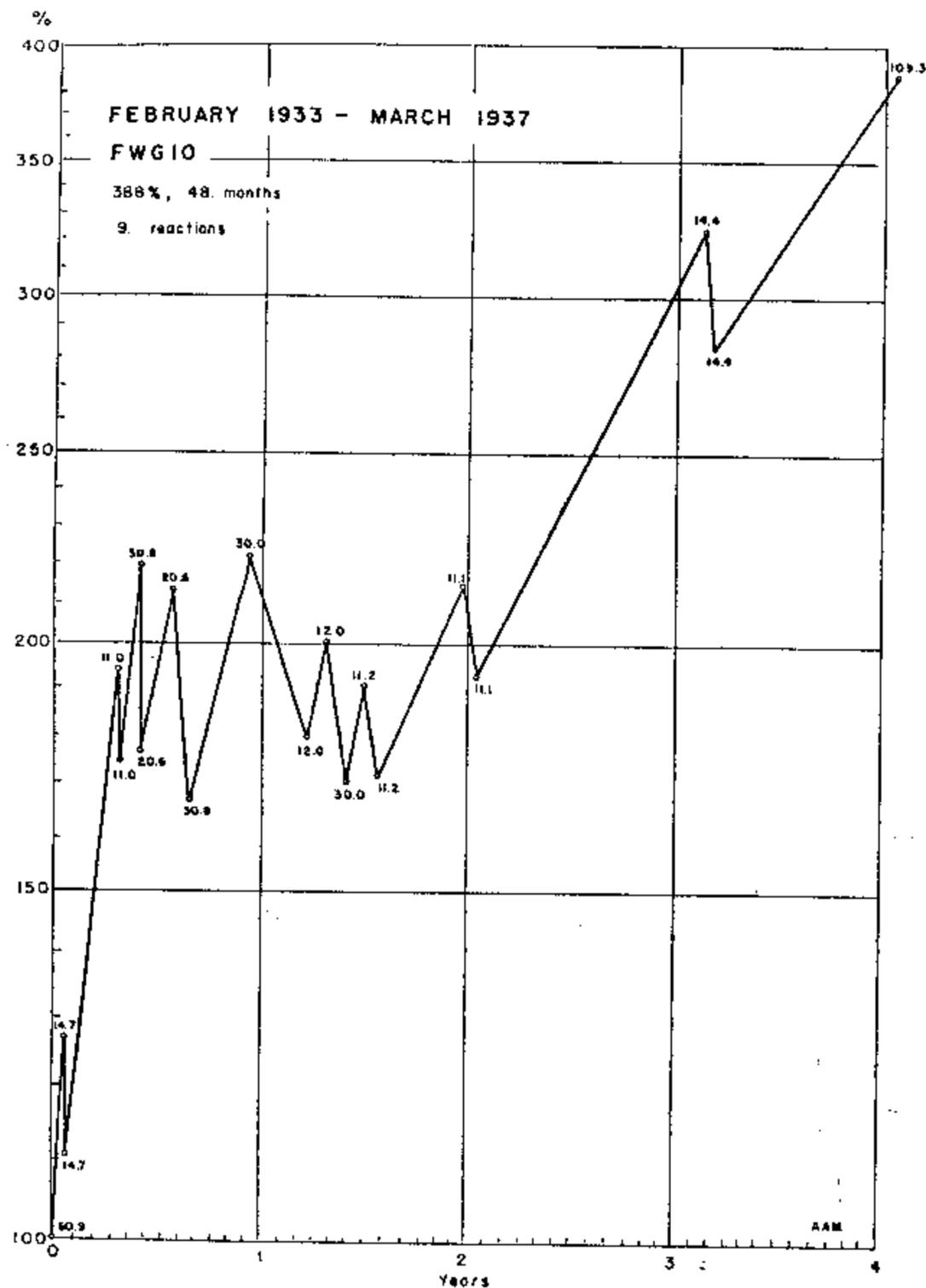
Bull market 1933-1937 continued:

FW	Date	Day	DJI	FW	Days
5.4	1/2/34	Tu	101.41	5.35	13
5.4	1/8/34	M	96.26	5.35	6
30.0	2/5/34	M	111.16	30.00 ↓	28
5.4	2/10/34	Sa	103.61	5.40	5
5.4	2/19/34	M	109.21	5.40	9
8.8	3/27/34	Tu	98.03	8.77	36
8.8	4/21/34	Sa	106.63	8.77	25
12.0	5/14/34	M	90.02	11.96 ↓	23
5.6	5/18/34	F	96.15	5.55	4
5.6	6/2/34	Sa	91.09	5.55	15
12.0	6/19/34	Tu	100.79	11.96 ↑	17
30.0	7/26/34	Th	85.51	30.00 ↑	37
11.2	8/25/34	Sa	95.71	11.16	30
11.2	9/17/34	M	86.10	11.16	23
6.1	1/7/35	M	106.17	6.05	112
6.1	2/7/35	Th	100.11	6.05	31
11.1	2/18/35	M	107.17	11.13	11
11.1	3/18/35	M	96.44	11.13	28
7.2	5/28/35	Tu	117.14	7.18	71
7.2	6/1/35	Sa	109.29	7.18	4
5.7	9/18/35	W	134.59	5.66	109
5.7	10/3/35	Th	127.38	5.66	15
7.3	11/20/35	W	149.05	7.28	48
7.3	12/19/35	Th	138.94	7.28	29
5.8	3/6/36	F	159.13	5.79	78
	(3/7/36	Sa	157.86)		
	(3/9/36	M	153.50)		
5.8	3/13/36	F	150.42	5.79	7
14.4	4/6/36	M	162.45	14.38	24
14.4	4/30/36	Th	142.03	14.38	24
5.4	8/10/36	M	169.50	5.41	102
5.4	8/21/36	F	160.80	5.41	11
5.5	11/18/36	W	185.52	5.50	89
5.5	12/21/36	M	175.85	5.50	3
109.3	3/6/37	Sa	194.47	109.29 ↓	105

German troops occupy Rhineland, defying Versailles Treaty

Bear market begins





BULL MARKET

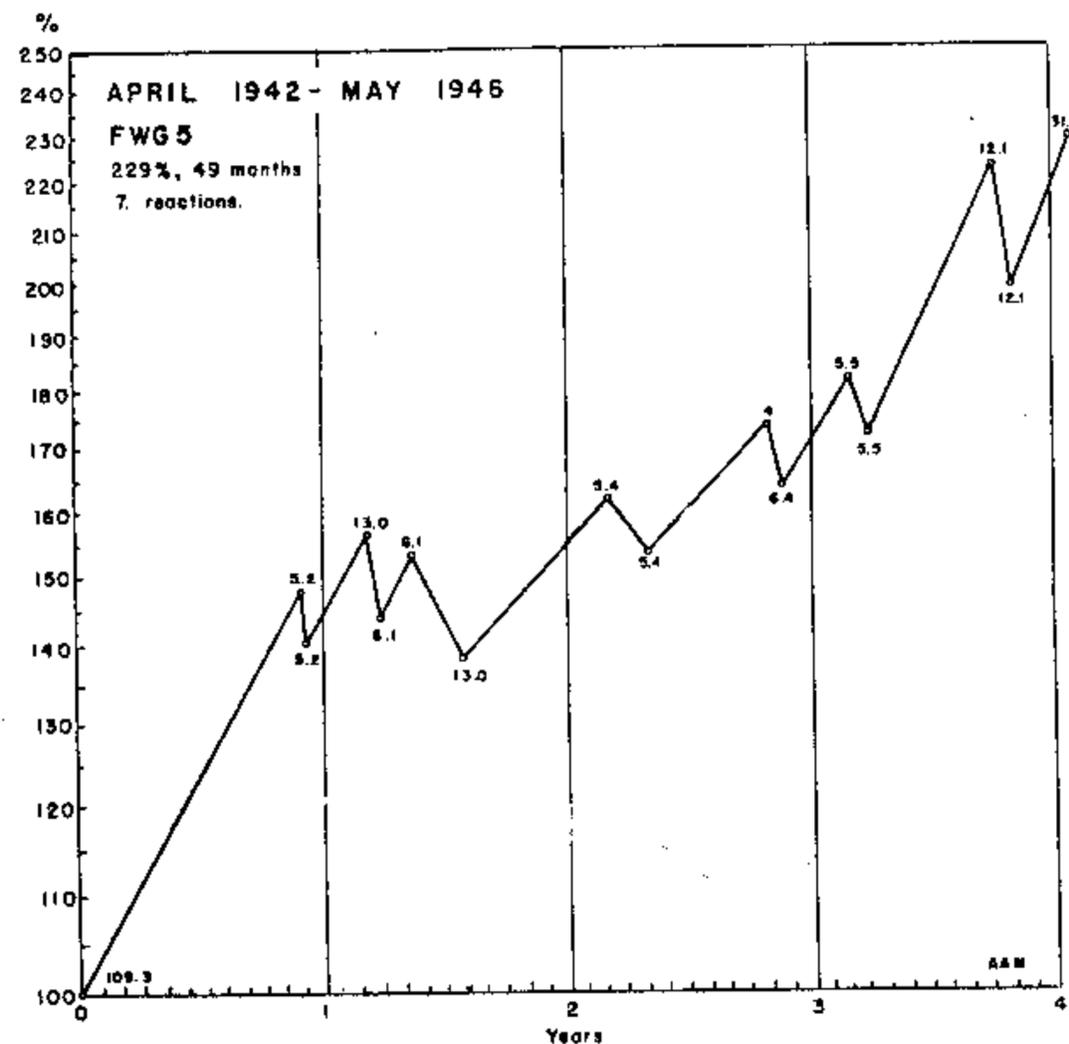
31 March 1938 - 10 November 1938

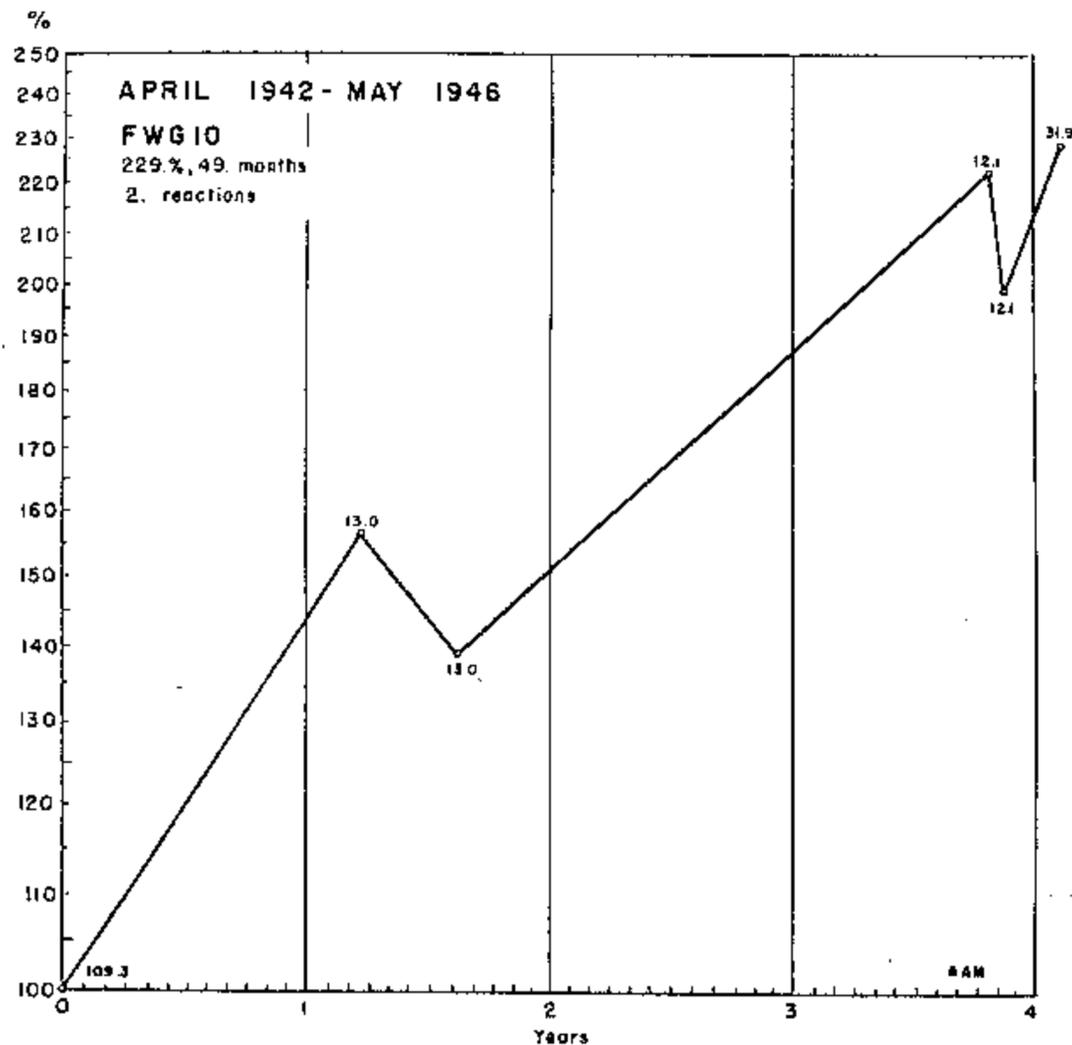
FW	Date	Day	DJI	FW	Days	
60.4	3/31/38	Th	98.75	60.42	36	Bull market begins
13.2	4/18/38	M	121.27	13.17 ↓	18	
8.9	5/2/38	M	109.85	8.91	14	
8.9	5/10/38	Tu	119.64	8.91	8	
13.2	5/31/38	Tu	107.16	13.17 ↑	21	
13.2	8/6/38	Sa	145.70	13.77 ↓	67	
6.5	8/12/38	F	135.87	6.51	6	
6.5	8/24/38	W	144.71	6.51	12	
6.3	9/14/38	W	131.17	6.33	21	
6.3	9/21/38	W	139.47	6.33	7	
13.8	9/28/38	W	128.07	13.77 ↑	7	
60.4	11/10/38	Th	158.41	60.42 ↑	43	Bear market begins

BULL MARKET

28 April 1942 - 29 May 1946

FW	Date	Day	DJI	FW	Days	
109.3	4/28/42	Tu	92.92	109.29	112	Bull Market begins
	(5/5/42)	Tu	97.29)			
	(5/6/42)	W	96.71)			Corregidor falls
	(5/7/42)	Th	97.77)			
	(11/6/42)	F	116.12)			
	(11/7/42)	S	116.92)			U. S. & Britain land on French N. Africa
	(11/9/42)	M	117.30)			
5.2	4/6/43	Tu	136.97	5.18	343	
5.2	4/13/43	Tu	130.23	5.18	7	
13.0	7/14/43	W	145.59	12.96 ↓	92	
6.1	8/2/43	M	134.00	6.10	19	
	(9/7/43)	Tu	137.59)			
	(9/8/43)	W	136.91)			Italy surrenders
	(9/9/43)	Th	137.75)			
6.1	9/20/43	M	142.18	6.10	49	
13.0	12/1/43	W	128.89	12.96 ↑	72	
	(6/5/44)	M	141.62)			
	(6/6/44)	Tu	142.21)			D Day - invasion of France by Allies
	(6/7/44)	W	142.12)			
5.4	7/10/44	M	150.57	5.35	222	
	(8/24/44)	Th	147.11)			
	(8/25/44)	F	147.02)			Paris liberated
	(8/28/44)	M	146.87)			
5.4	9/7/44	Th	142.93	5.35	59	
	(10/19/44)	Th	148.55)			
	(10/20/44)	F	148.21)			Americans invade Philippines
	10/21/44	Sa	148.35)			
6.4	3/6/45	Tu	161.82	6.37	180	
6.4	3/27/45	Tu	152.13	6.37	21	
	(4/11/45)	W	158.06)			
	(4/12/45)	Th	158.48)			Roosevelt death
	(4/13/45)	F	159.75)			
	(5/1/45)	Tu	165.09)			
	(5/2/45)	W	165.03)			Berlin falls
	(5/3/45)	Th	165.84)			
	(5/7/45)	M	166.53)			
	(5/8/45)	Tu	166.42)			VE - Germany surrenders
	(5/9/45)	W	165.24)			
5.5	6/26/45	Tu	169.15	5.51	91	
5.5	7/27/45	F	160.32	5.51	31	
	(8/3/45)	F	163.06)			
	(8/6/45)	M	163.19)			Bomb dropped on Hiroshima
	(8/7/45)	Tu	161.55)			
	(8/8/45)	W	161.83)			
	(8/9/45)	Th	164.55)			Bomb dropped on Nagasaki
	(8/10/45)	F	165.14)			
	(8/13/45)	M	164.11)			
	(8/14/45)	Tu	164.79)			Japan surrenders (9/2/45 = VJ, with formal surrender)
	(8/17/45)	F	164.38)			
12.1	2/4/46	M	207.24	12.14	192	
12.1	2/26/46	Tu	184.80	12.14	22	
31.9	5/29/46	W	212.50	31.91 ↓	92	Bear market begins





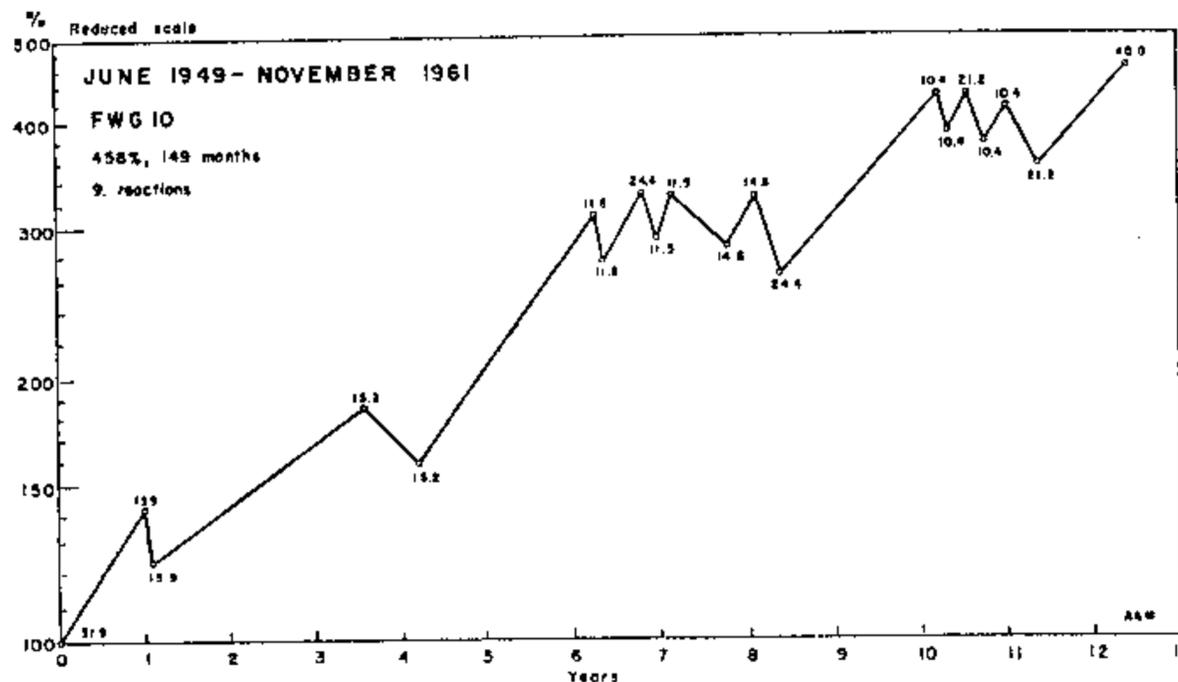
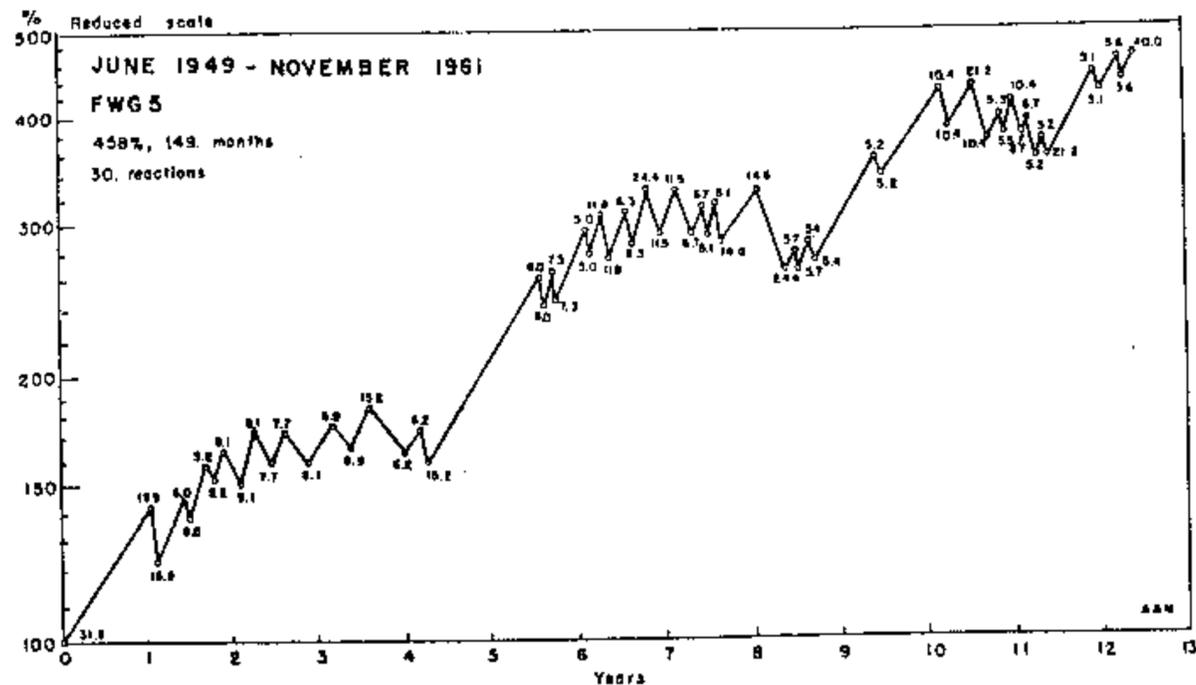
BULL MARKET

14 June 1949 - 15 November 1961

FW	Date	Day	DJI	FW	Days	Notes
31.9	6/14/49	Tu	161.10	31.91	158	Bull Market begins
	(9/22/49)	Th	180.83)			
	(9/23/49)	F	181.30)			Russia explodes their first atom bomb
	(9/26/49)	M	180.86)			
15.9	6/12/50	M	228.44	15.89	363	
	(6/23/50)	F	224.35)			
	(6/24/50)	Sa	closed)			← Republic of Korea invaded
	(6/26/50)	M	213.91)			
	(6/27/50)	Tu	212.22)			Truman orders aid to Korea
	(6/28/50)	W	214.68)			
15.9	7/13/50	Th	197.11	15.89	31	
	(8/25/50)	F	218.10)			
	(8/27/50)	Su	closed)			Army seizes railroads to avoid strike
	(8/28/50)	M	218.55)			
6.0	11/25/50	Sa	235.62	5.98	135	
6.0	12/4/50	M	222.33	5.98	9	
5.2	2/13/51	Tu	255.96	5.16	71	
5.2	3/15/51	Th	243.39	5.16	30	
9.1	5/4/51	F	263.64	9.08	50	
9.1	7/2/51	M	241.70	9.08	59	
8.1	9/17/51	M	276.39	8.06 ↓	77	
7.7	11/26/51	M	255.82	7.67	70	
7.7	1/23/52	W	275.45	7.67	58	
8.1	5/1/52	Th	255.78	8.06 ↑	99	
	(6/2/52)	M	262.31)			
	(6/3/52)	Tu	262.09)			← Steel strike (to 7/24/52)
	(6/4/52)	W	263.67)			
6.9	8/11/52	M	280.62	6.85	102	
6.9	10/23/52	Th	262.62	6.85	73	
15.2	1/5/53	M	293.79	15.16 ↓	74	
6.2	6/10&16/53	W	261.36	6.20	159	
	(7/24/53)	F	269.76)			
	(7/26/53)	Su	closed)			Korean armistice signed
	(7/27/53)	M	268.46)			
6.2	8/13/53	Th	277.57	6.20	61	
	(8/19/53)	W	271.50)			
	(8/20/53)	Th	271.73)			Russia explodes their first H bomb
	(8/21/53)	F	271.93)			
15.2	9/15/53	Tu	255.11	15.16 ↑	33	
6.0	1/3/55	M	409.52	5.98	475	
6.0	1/18/55	Tu	386.41	5.98	15	
7.3	3/4/55	F	420.07	7.34	45	
7.3	3/14/55	M	391.36	7.34	10	
5.0	7/27/55	W	469.74	5.03	135	
5.0	8/9/55	Tu	447.25	5.03	13	
	(9/22/55)	Th	485.96)			
11.8	9/23/55	F	487.45	11.83	45	Eisenhower heart attack
	(9/26/55)	M	455.56)			
	(9/27/55)	Tu	465.93)			

Bull market 1949- 1961 continued:

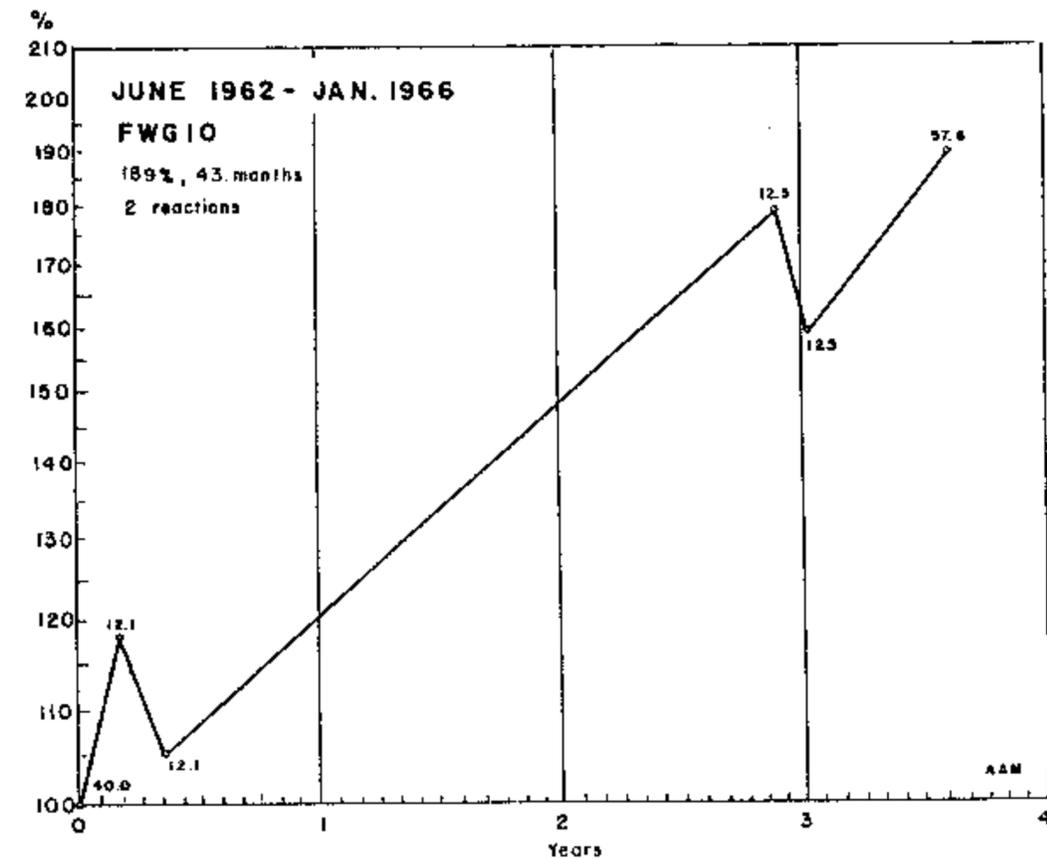
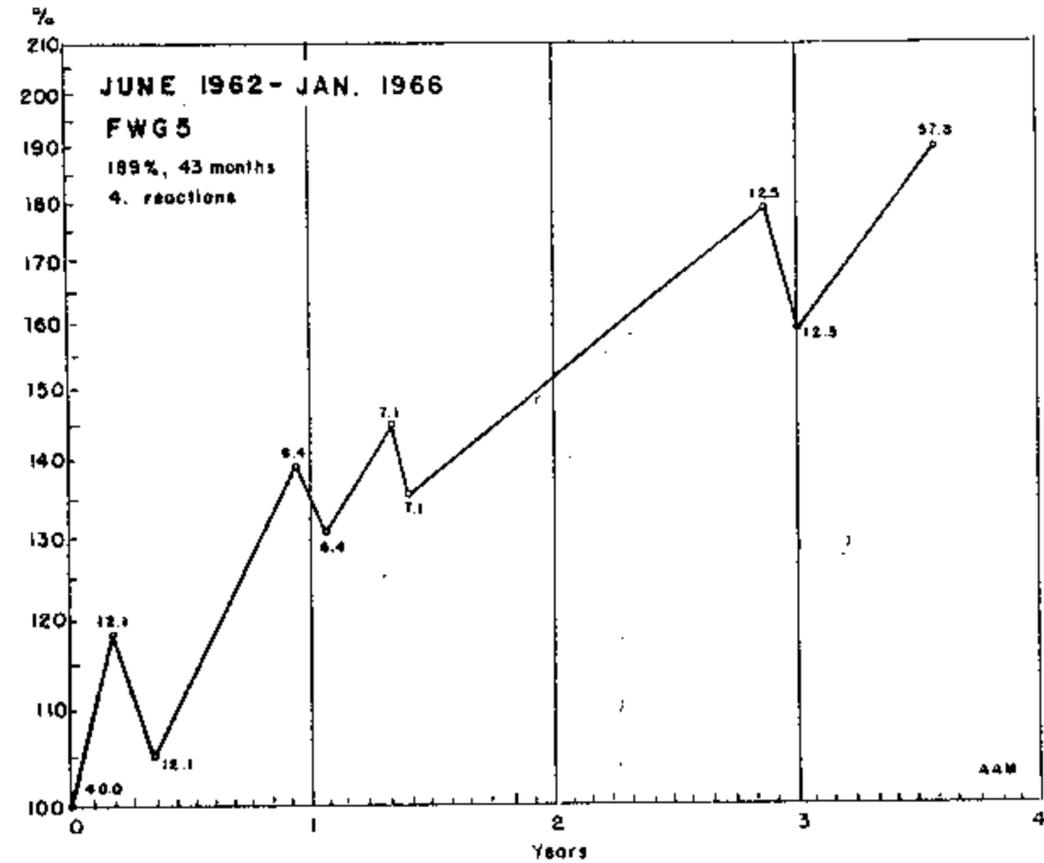
FW	Date	Day	DJI	FW	Days
11.8	10/11/55	Tu	435.87	11.83	18
6.3	1/3/56	Tu	489.45	6.32	84
6.3	1/23/56	M	460.34	6.32	20
24.4	4/9/56	M	522.18	24.39 ↓	77
11.5	5/28/56	M	467.58	11.51	49
	(7/25/56	W	514.13)		
	(7/26/56	Th	515.85) ← Egypt seizes Suez Canal		
	(7/27/56	F	512.30)		
11.5	8/9/56	Th	521.39	11.51	73
6.7	10/1/56	M	468.38	6.69	53
6.7	11/7/56	W	499.72	6.69	37
8.1	11/29/56	Th	463.06	8.12	22
8.1	1/4/57	F	500.65	8.12	36
14.6	2/12/57	Tu	454.82	14.61	39
14.6	7/15/57	M	521.27	14.61	153
	(10/3/57	Th	465.82)		
	(10/4/57	F	461.70) ← Sputnik launched		
	(10/7/57	M	452.42)		
24.4	10/22/57	Tu	419.79	24.39 ↑	99
5.7	12/4/57	W	449.93	5.70	43
5.7	12/17/57	Tu	425.65	5.70	13
	(1/30/58	Th	449.72)		
	(1/31/58	F	450.02) ← First U. S. satellite Explorer I.		
	(2/3/58	M	453.98)		
5.4	2/4/58	Tu	458.65	5.42	49
5.4	2/25/58	Tu	435.07	5.42	21
5.2	11/17/58	M	568.35	5.15	265
5.2	11/25/58	Tu	540.52	5.15	8
10.4	8/3/59	M	679.52	10.35	251
10.4	9/22/59	Tu	615.76	10.35	50
21.2	1/4/60	M	685.83	21.16 ↓	104
10.4	3/9/60	W	597.60	10.39 ↓	65
5.5	4/18/60	M	632.68	5.52	40
5.5	5/2/60	M	599.61	5.52	14 U-2 shot down
10.4	6/9/60	Th	659.69	10.39 ↑	38
6.7	7/25/60	M	600.61	6.65	46
6.7	8/24/60	W	641.56	6.65	30
5.2	9/29/60	Th	568.12	5.17	36
5.2	10/17/60	M	597.52	5.17	18
21.2	10/25/60	Tu	566.05	21.16 ↑	8
	(12/30/60	F	615.89)		
	(1/3/61	Tu	610.25) ← U. S. severs relations with Cuba		
	(1/4/61	W	621.49)		
5.1	5/22/61	M	710.93	5.10	209
5.1	6/19/61	M	676.46	5.10	28
5.6	9/7/61	Th	730.62	5.60	80
5.6	9/25/61	M	691.86	5.60	18
40.0	11/15/61	W	737.50	40.03 ↓	51 ← Bear market begins

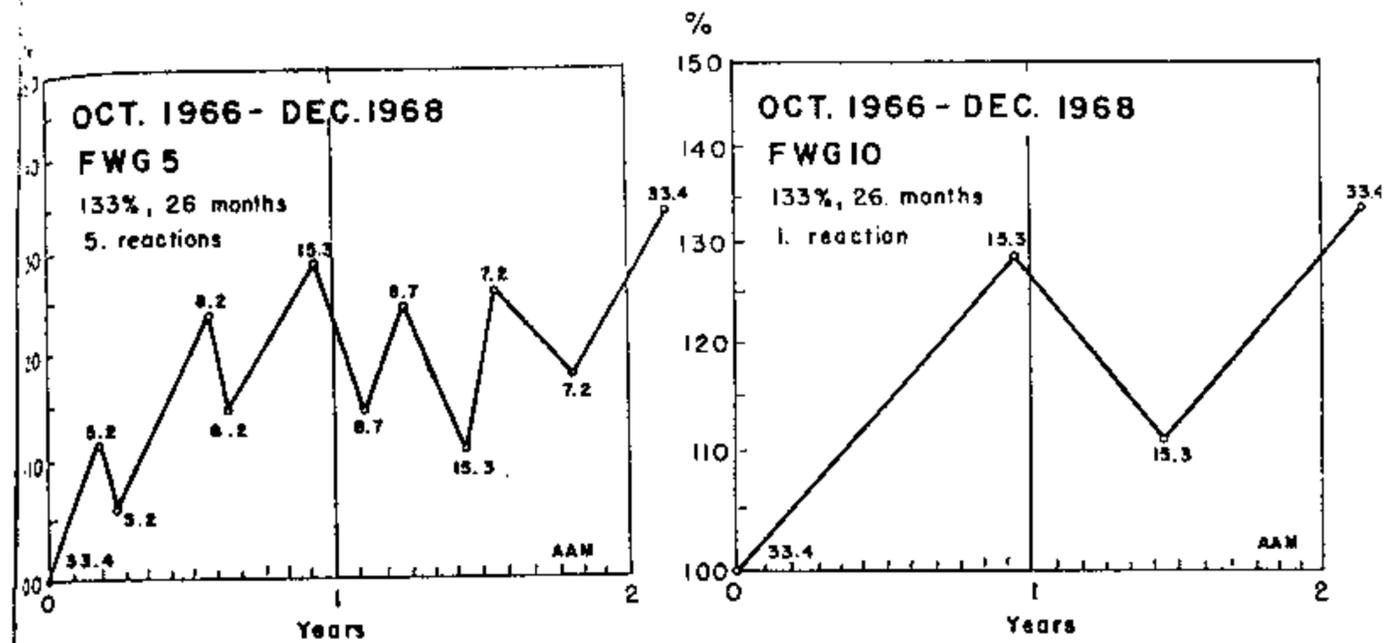


BULL MARKET

25 June 1962 - 19 January 1966

FW	Date	Day	DJI	FW	Days	
40.0	6/25/62	M	526.69	40.03 ↓	25	← Bull market begins
12.1	8/23/62	Th	619.97	12.13	59	
12.1	10/24/62	W	552.92	12.13	62	
6.4	6/5/63	W	730.73	6.44	224	
6.4	7/22/63	M	686.55	6.44	47	
7.1	10/29/63	Tu	762.09	7.11	99	
	(11/21/63)	Th	732.65)			
7.1	11/22/63	F	711.49	7.11	24	Kennedy assassination
	(11/26/63)	Tu	743.52)			
	(10/15/64)	Th	868.44)			
	(10/16/64)	F	873.54)			← China's first bomb
	(10/19/64)	M	876.21)			
12.5	5/14/65	F	939.97	12.50	539	
12.5	6/29/65	Tu	835.54	12.50	46	
57.8	1/19/66	W	995.87	57.78	204	← Bear market begins





BULL MARKET

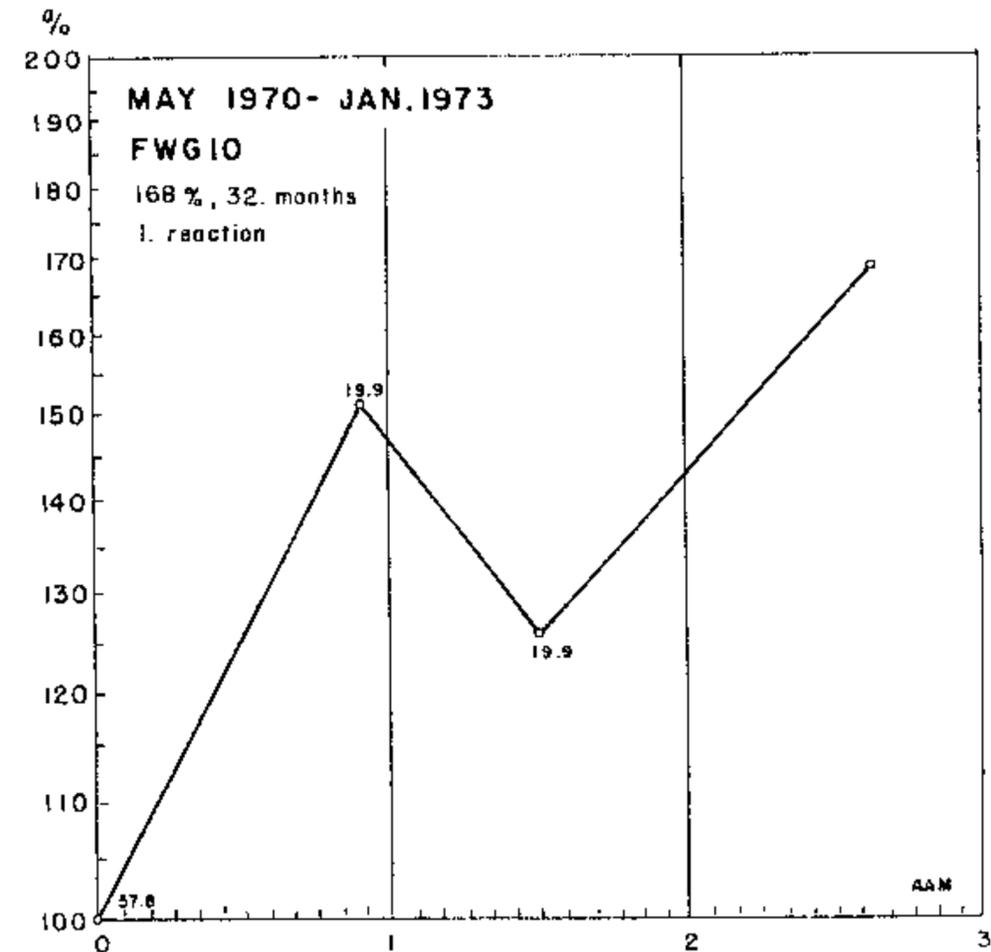
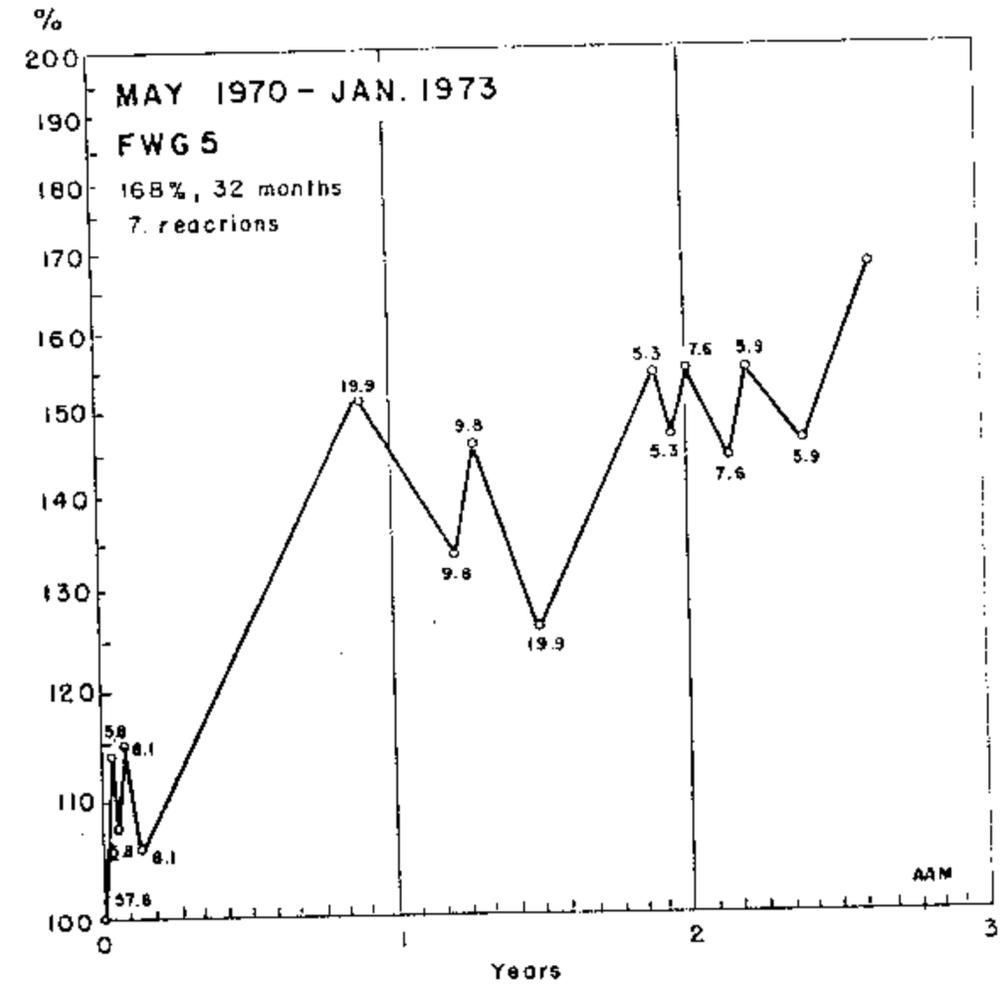
10 October 1966 - 2 December 1968

FW	Date	Day	DJI	FW	Days	Event
33.4	10/10/66	M	740.03	33.37	24	Bull Market begins
5.2	12/13/66	Tu	822.60	5.18	64	
5.2	1/4/67	W	782.07	5.18	22	
8.2	5/9/67	Tu	911.19	8.15	125	
	(6/2/67	F	863.31)			
	6/5/67	M	842.54	8.15	27	Israeli-Arab war (to 6/10)
	(6/6/67	Tu	862.71)			
15.3	9/26/67	Tu	946.95	15.30 ↓	113	
8.7	11/20/67	M	843.22	8.65	55	
8.7	1/9/68	Tu	916.20	8.65	50	1/23/68 U.S.S. Pueblo seized
15.3	3/22/68	F	821.26	15.30 ↑	73	
7.2	5/3/68	F	929.96	7.22	42	
7.2	8/9/68	F	867.36	7.22	98	
33.4	12/2/68	M	987.01	33.37 ↑	115	Bear market begins

BULL MARKET

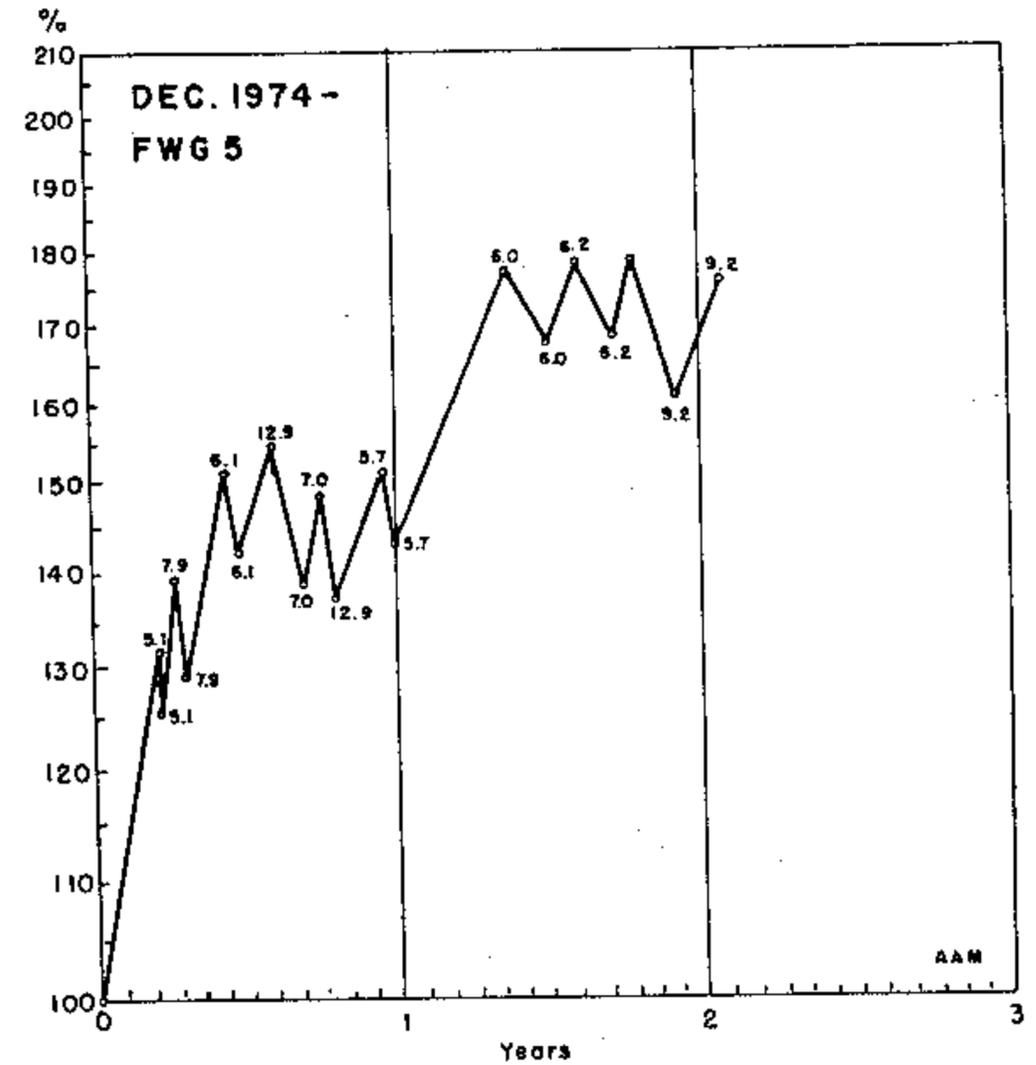
26 May 1970 - 11 January 1973

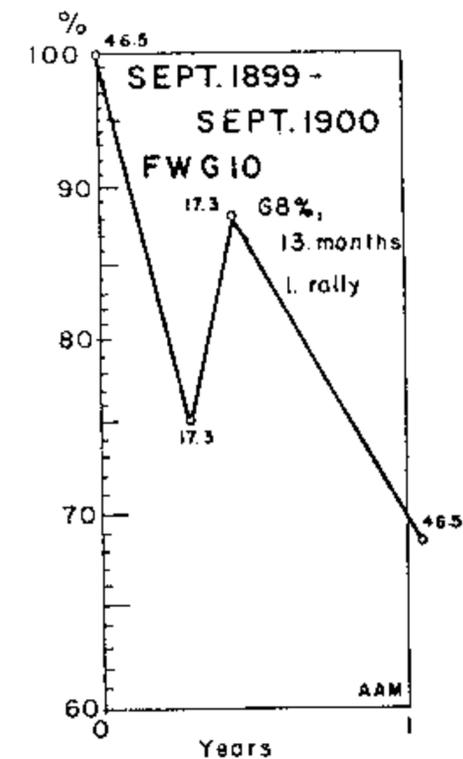
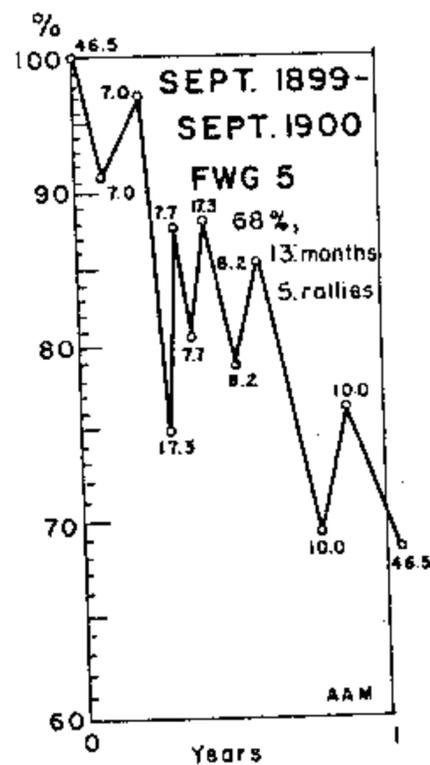
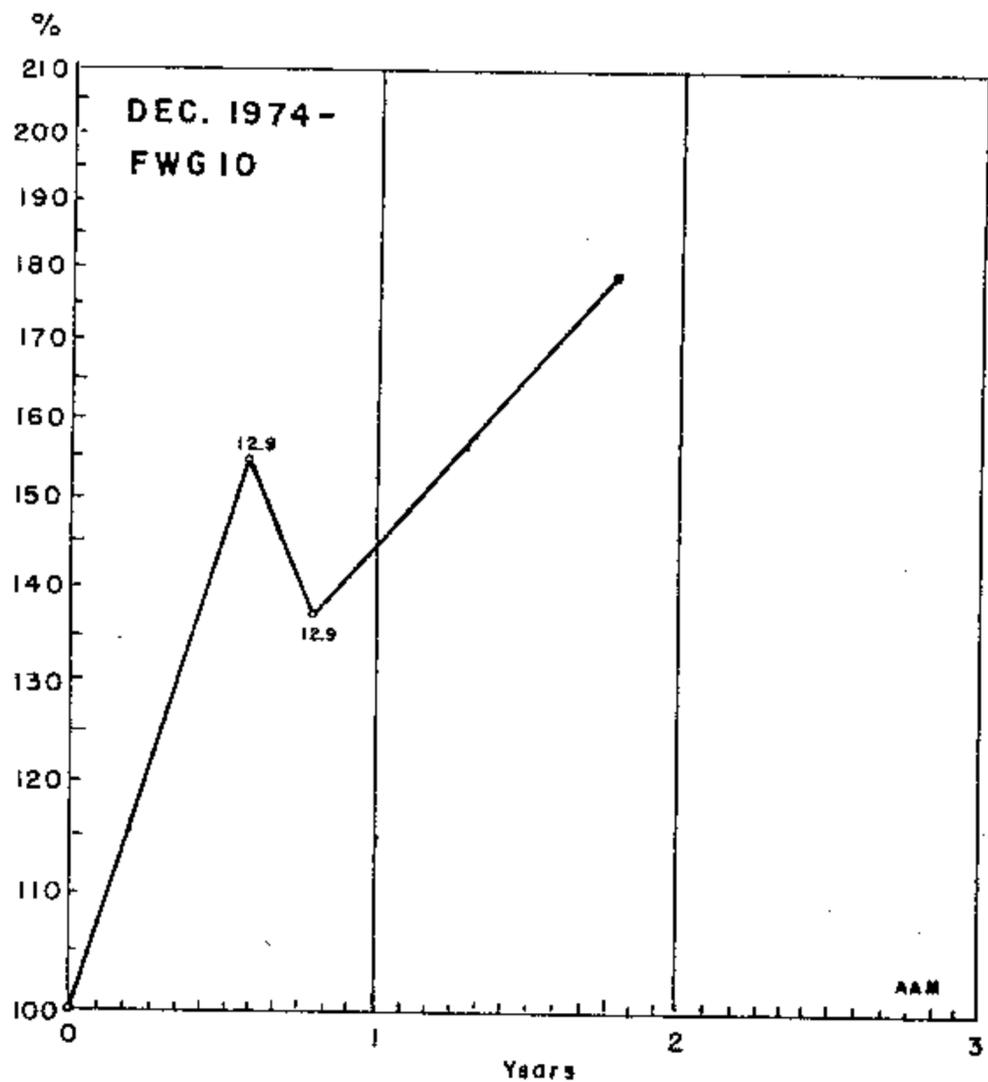
FW	Date	Day	DJI	FW	Days	
57.8	5/26/70	Tu	631.16	57.78	47	Bull Market begins
5.8	6/4/70	Th	717.42	5.81	9	
5.8	6/12/70	F	678.05	5.81	8	
8.1	6/19/70	F	722.48	8.12	7	
8.1	7/8/70	W	668.20	8.12	19	
19.9	4/28/71	W	951.52	19.93	294	
9.8	8/10/71	Tu	839.08	9.78	104	8/15/71 Wages and prices frozen
9.8	9/8/71	W	921.14	9.78	29	
19.9	11/23/71	Tu	793.37	19.93	76	12/18/71 Dollar devalued
5.3	4/18/72	Tu	972.16	5.29	147	
5.3	5/9/72	Tu	923.31	5.29	21	Vietnam harbors mined
7.6	5/30/72	Tu	974.26	7.61	21	
7.6	7/18/72	Tu	905.40	7.61	49	
5.9	8/14/72	M	974.71	5.91	27	
5.9	10/17/72	Tu	920.30	5.91	64	11/7/72 Nixon reelected
	1/11/73	Th	1061.14		86	Bear Market begins



BULL MARKET
9 December 1974 -

FW	Date	Day	DJI	FW	Days	
	12/9/74	M	572.20		33	Bull Market begins
5.1	2/21/75	F	752.35	5.06	74	
5.1	2/26/75	W	716.13	5.06	5	
7.9	3/18/75	Tu	792.79	7.88	20	
7.9	3/25/75	Tu	734.90	7.88	7	
6.1	5/15/75	Th	863.81	6.12	51	5/7/75 Vietnam war ends
6.1	5/29/75	Th	813.99	6.12	14	
12.9	7/16/75	W	885.25	12.89	48	
7.0	8/21/75	Th	789.89	6.95	36	
7.0	9/9/75	Tu	844.81	6.95	19	
12.9	10/1/75	W	784.16	12.89	22	10/2/75 W. T. Grant bankruptcy
5.7	11/28/75	F	862.96	5.72	58	
5.7	12/8/75	M	816.28	5.72	10	
6.0	4/22/76	Th	1013.38	5.95	136	
6.0	6/7/76	M	956.45	5.95	46	
6.2	7/13/76	Tu	1016.13	6.18	36	
6.2	8/27/76	F	957.03	6.18	45	
	9/22/76	W	1021.86		26	
9.2	11/11/76	Th	920.63	9.21	50	11/2/76 Carter elected
9.2	1/3/77	M	1005.40	9.21	53	





BEAR MARKET

2 October 1899 - 24 September 1900

FW	Date	Day	DJI	FW	Days	
46.5	9/5/99	Tue	56.63	46.54	75	Bear mkt. begins
7.0	10/2/99	M	51.77	7.02	27	
7.0	11/18/99	Sa	55.41	7.02	47	
	(12/16/99)	Sa	46.58			
17.3	12/18/99	M	42.52	17.32	30	London calls for capital,
	(12/19/99)	Tu	44.53			call money goes to 186%
7.7	1/2/1900	Tu	49.71	7.68	15	
7.7	1/11/00	Th	46.17	7.68	9	
17.3	2/5/00	M	49.88	17.32	25	
8.2	3/9/00	F	44.59	8.24	33	
8.2	4/6/00	F	48.27	8.24	28	
10.0	6/23/00	Sa	39.17	9.95	78	
10.0	7/23/00	M	43.07	9.95	30	
46.5	9/24/00	M	38.64	46.54	63	Bull market begins

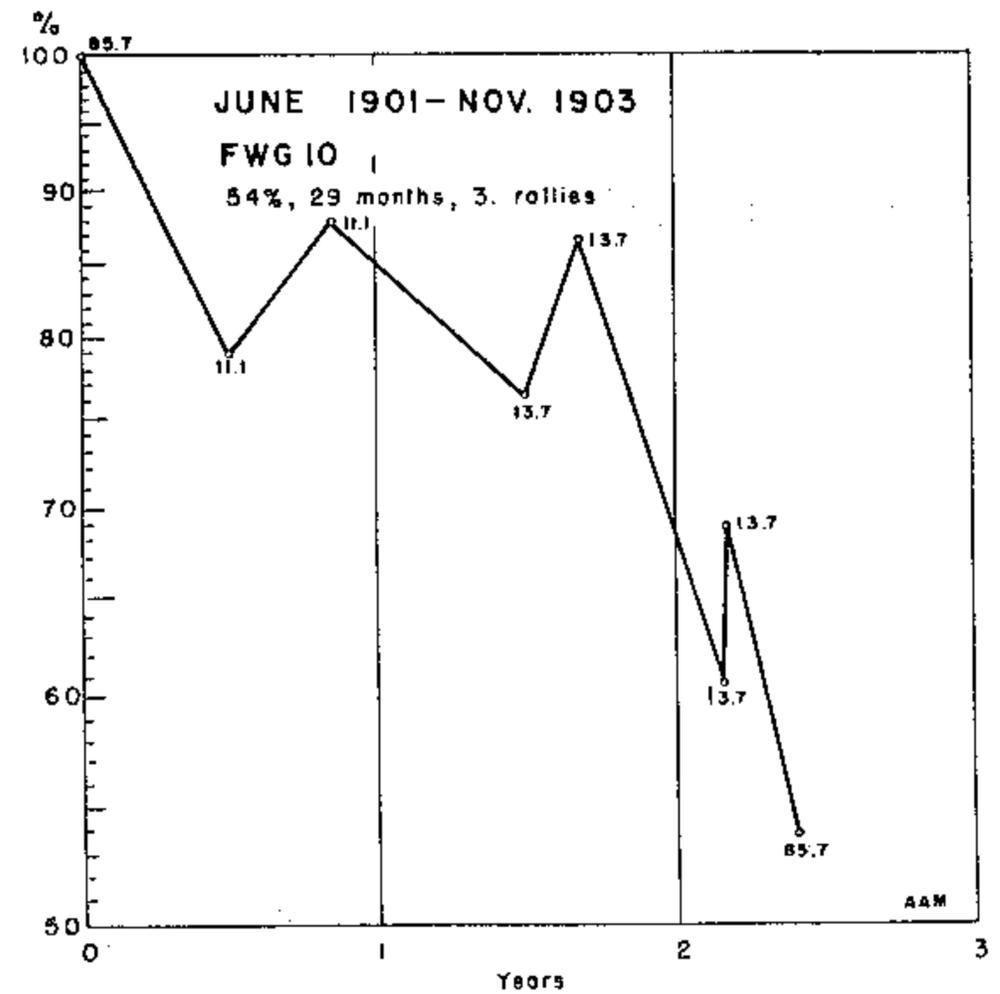
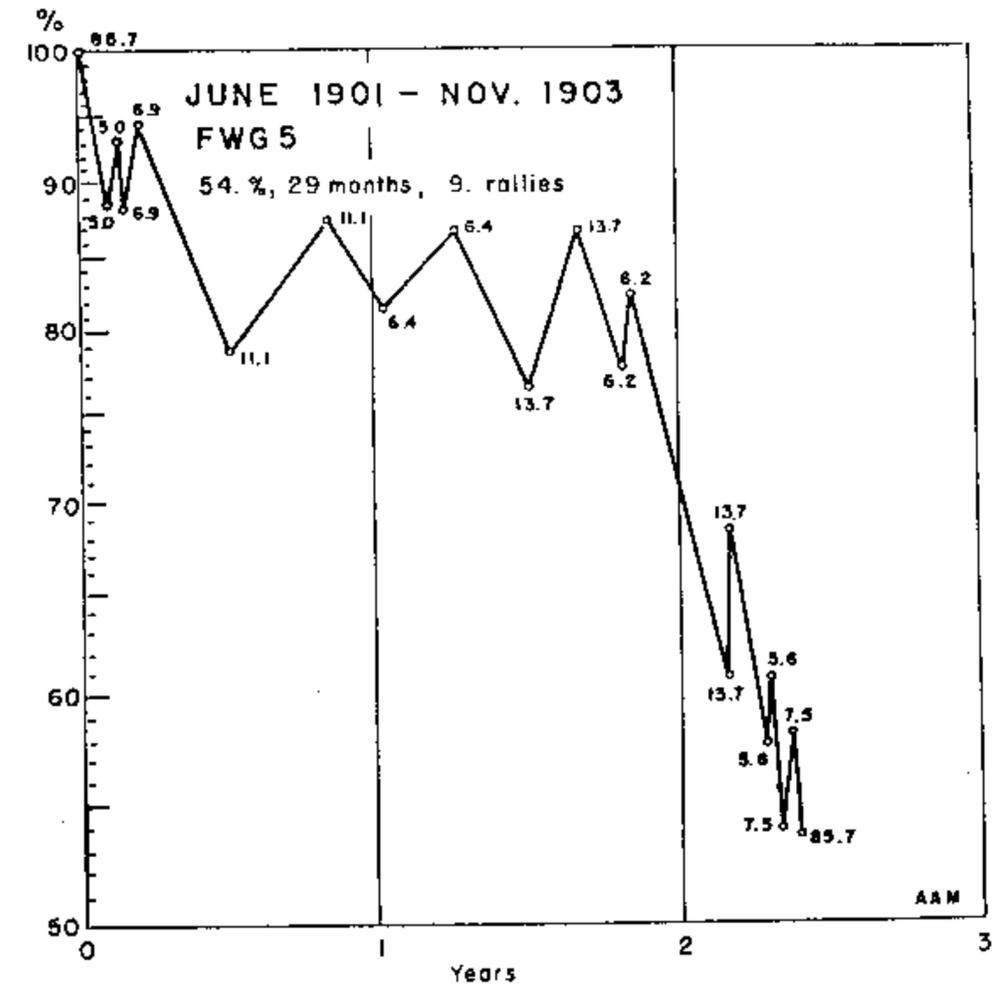
BEAR MARKET

17 June 1901 - 9 November 1903

FW	Date	Day	DJI	FW	Days	
85.7	6/17/01	M	57.11	85.67	39	Bear Market begins
5.0	7/15/01	M	50.68	5.01	28	
5.0	7/29/01	M	53.22	5.01	14	
6.9	8/6/01	Tu	50.39	6.92	8	
6.9	8/26/01	M	53.87	6.92	20	
	(9/5/01	Th	53.31)			
	(9/6/01	F	52.71)			McKinley shot (died 9/14/01)
	(9/7/01	Sa	50.37)			
11.1	12/12/01	Th	44.96	11.09	108	
11.1	4/24/02	Th	49.94	11.09	133	
6.4	6/24/02	Tu	46.46	6.44	61	
6.4	9/19/02	F	49.45	6.44	87	
13.7	12/15/02	M	43.47	13.65	87	
13.7	2/16/03	M	49.40	13.65	63	
6.2	4/13/03	M	44.36	6.20	56	
6.2	4/21/03	Tu	47.11	6.20	8	
13.7	8/8/03	Sa	34.57	13.72	109	
13.7	8/17/03	M	39.32	13.72	9	
5.6	9/28/03	M	32.90	5.61	42	
5.6	10/2/03	F	34.75	5.61	4	
7.5	10/15/03	Th	30.83	7.48	13	
7.5	10/27/03	Tu	33.14	7.48	12	
85.7	11/9/03	M	30.76	85.67	13	

The "Rich Man's
Panic" -- a credit
squeeze --

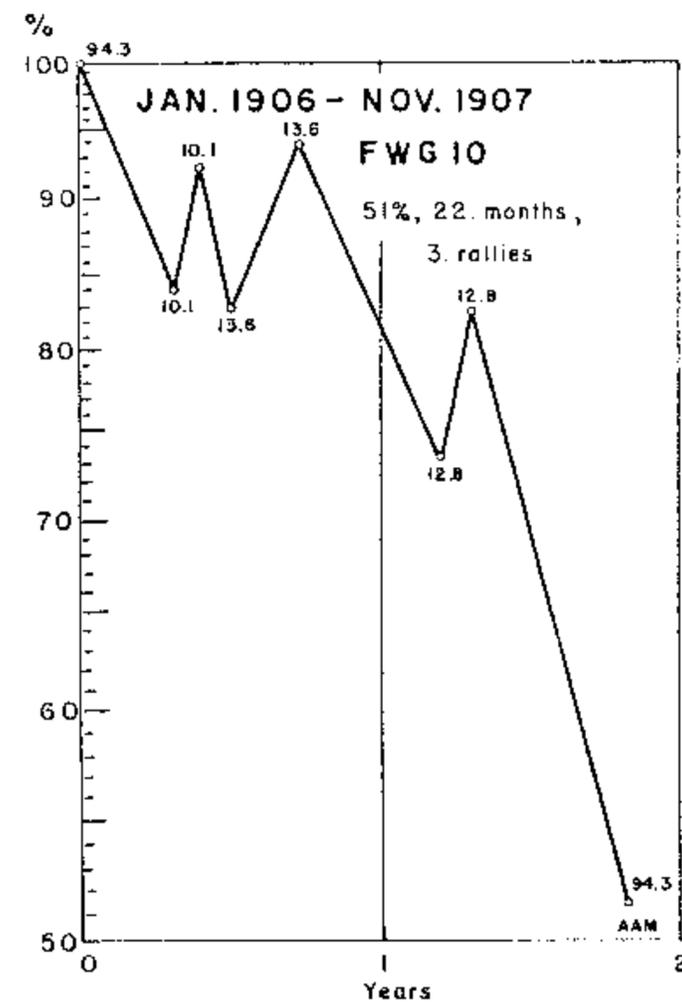
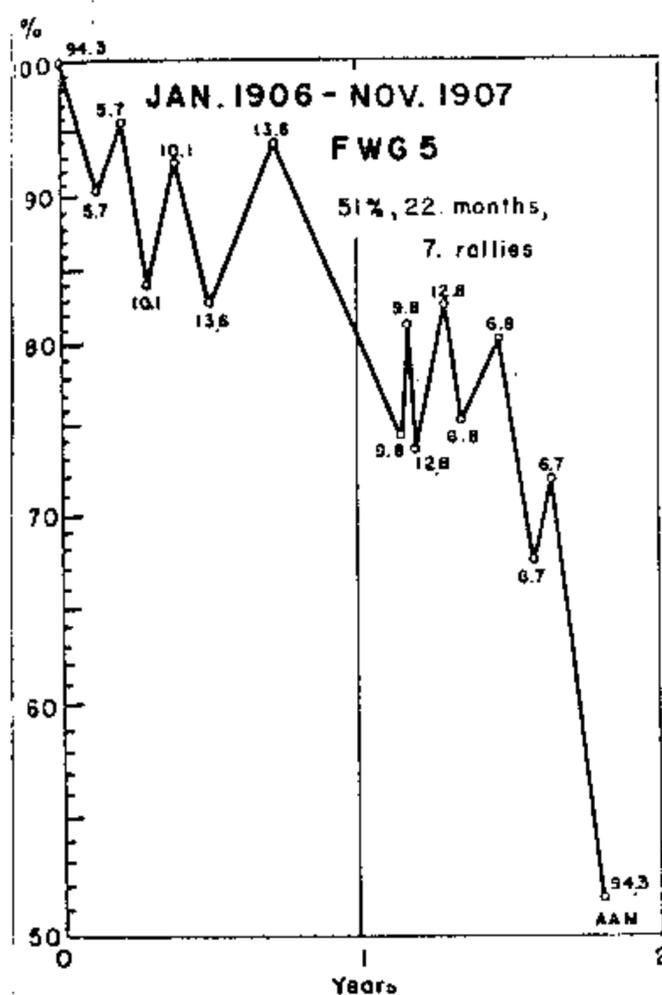
bull market begins



BEAR MARKET

19 January 1906 - 15 November 1907

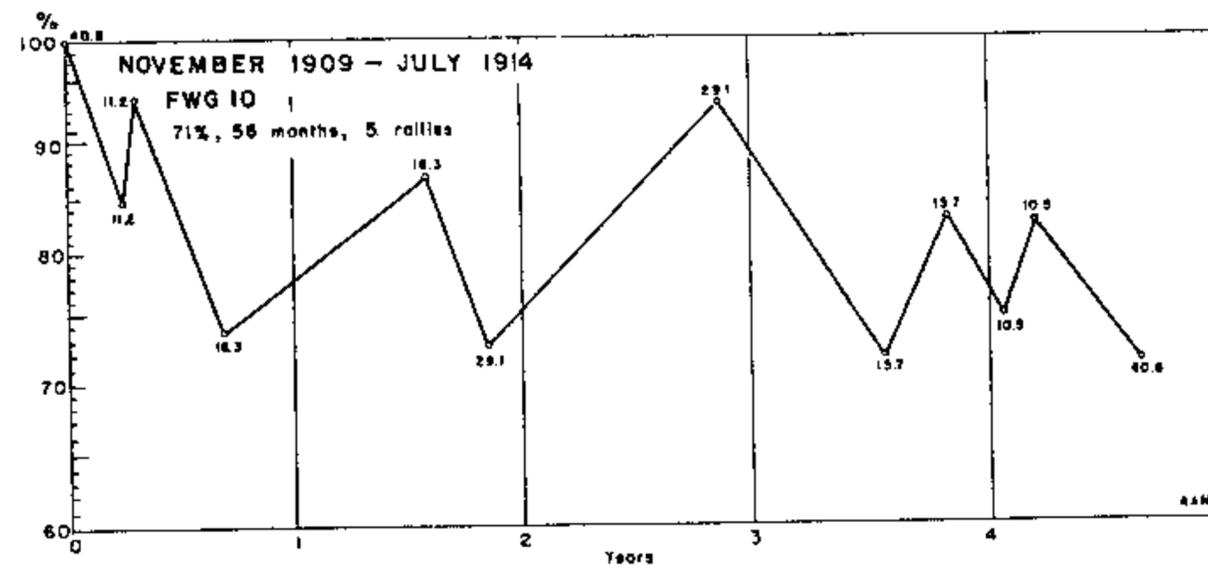
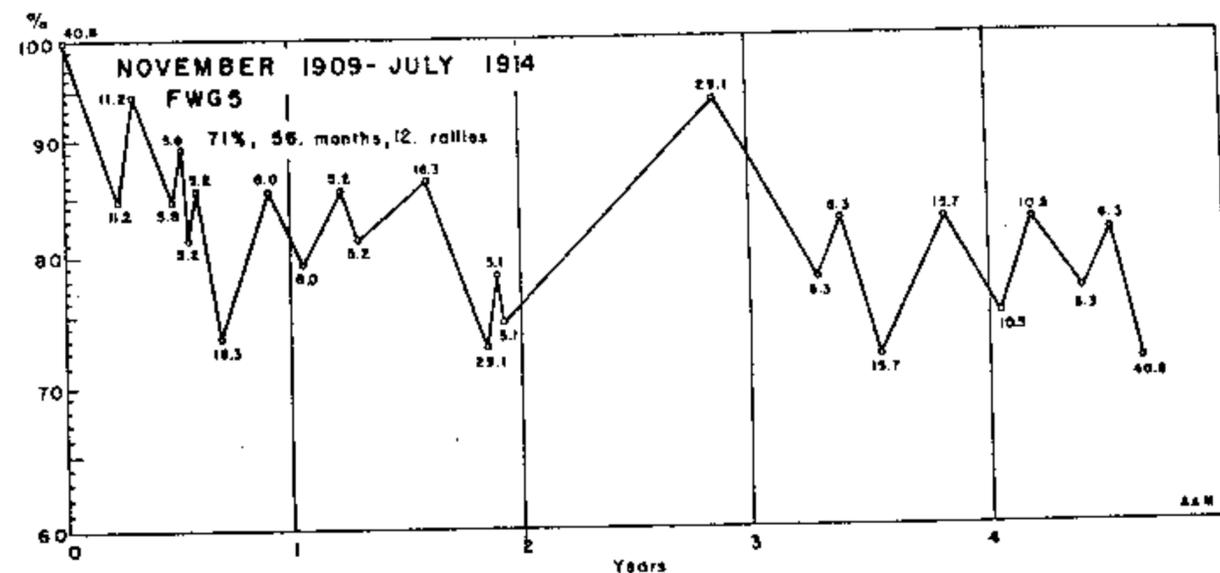
FW	Date	Day	DJI	FW	Days	
94.3	1/19/06	F	75.16	94.34	134	Bear market begins
5.7	3/5/06	M	67.79	5.69	45	
5.7	4/3/06	Tu	71.65	5.69	29	
	(4/18/06)	W	69.81			
	(4/19/06)	Th	68.76			← San Francisco earthquake
	(4/20/06)	F	69.53			
10.1	5/3/06	Th	63.08	10.11	30	
10.1	6/6/06	W	69.47	10.11	34	
13.6	7/13/06	F	62.16	13.58	37	
13.6	10/9/06	Tu	70.60	13.58	88	
9.8	3/14/07	Th	55.63	9.79	156	
9.8	3/16/07	Sa	61.07	9.79	2	
12.8	3/25/07	M	55.01	12.77	9	
12.8	5/3/07	F	62.04	12.77	39	
6.8	5/27/07	M	56.41	6.75	24	
6.8	7/6/07	Sa	60.21	6.75	40	
6.7	8/21/07	Tu	50.53	6.70	46	
6.7	9/6/07	F	53.92	6.70	16	
	(10/16/07)	W	44.12			
	(10/17/07)	Th	44.17			← Panic at Hamburg
	(10/18/07)	F	43.15			
	(10/21/07)	M	44.37			The "Banker's Panic" ;
	(10/22/07)	Tu	43.13			Knickerbocker Trust has run - closes -
	(10/23/07)	W	42.48			Almost every bank in N. Y. has run and
	(10/24/07)	Th	42.45			closes. Demand loans go to 125%.
	(10/25/07)	F	42.54			
94.3	11/15/07	F	38.67	94.34	70	Bull market begins

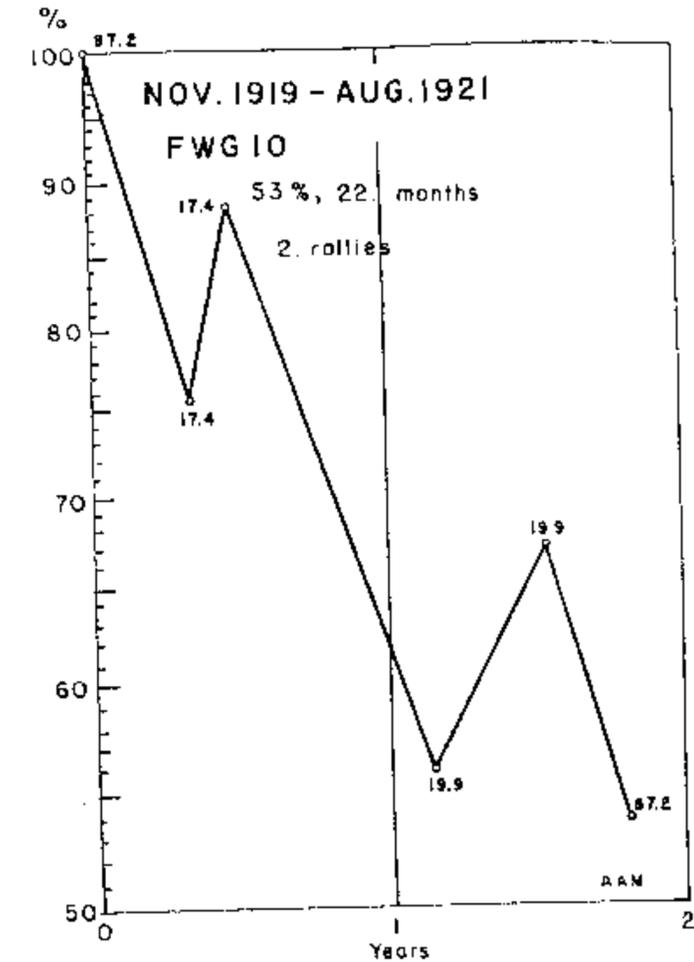
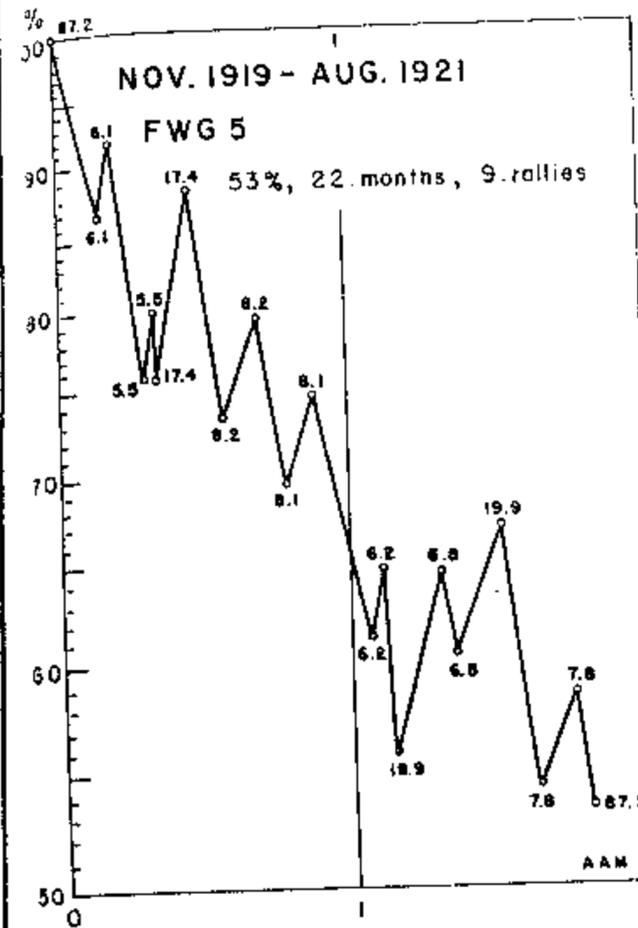
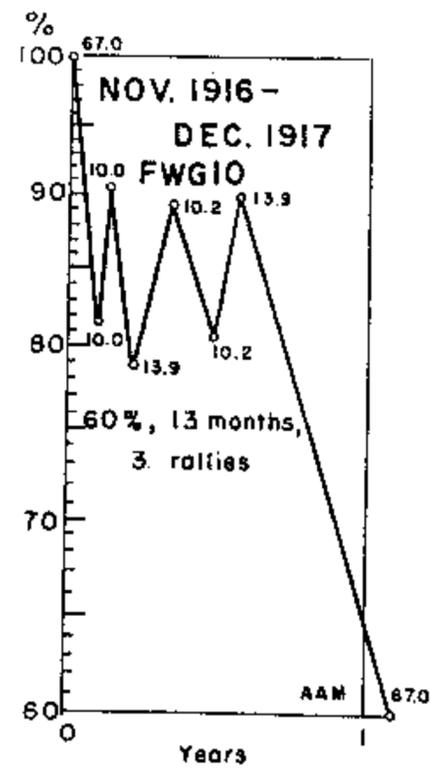
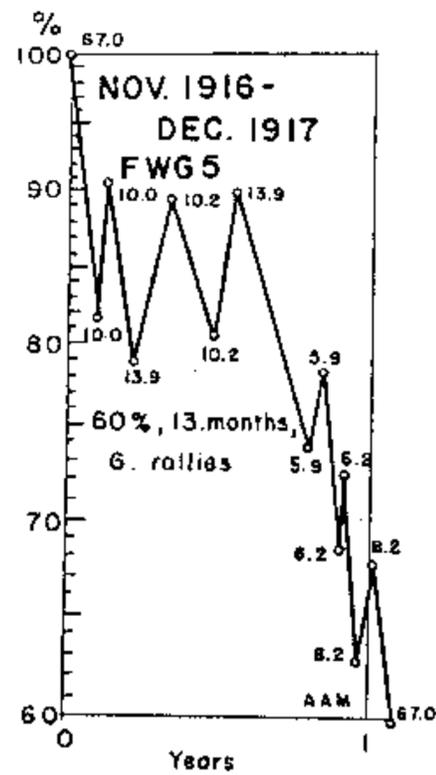


BEAR MARKET

19 November 1909 - 30 July 1914

FW	Date	Day	DJI	FW	Days	
40.8	11/19/09	F	73.36	40.76 ↓	27	Bear Market begins
11.2	2/8/10	Tu	62.05	11.21	81	
11.2	3/8/10	Tu	69.00	11.21	28	
5.8	5/3/10	Tu	61.82	5.83	56	
5.8	5/21/10	Sa	65.42	5.83	18	
5.2	6/6/10	M	59.87	5.15	16	
5.2	6/22/10	W	62.96	5.15	16	
18.3	7/26/10	Tu	53.72	18.26 ↑	34	
8.0	10/18/10	Tu	62.77	7.96	84	
8.0	12/6/10	Tu	58.14	7.96	49	
5.2	2/4/11	Sa	62.77	5.16	60	
5.2	3/4/11	Sa	59.69	5.16	28	
18.3	6/19/11	M	63.53	18.26 ↑	107	
29.1	9/25/11	M	53.22	29.08 ↓	98	
5.1	10/14/11	Sa	57.40	5.13	19	
5.1	10/27/11	F	54.60	5.13	13	
29.1	9/30/12	M	68.70	29.08 ↑	339	
6.3	3/20/13	Th	57.10	6.31	171	
6.3	4/4/13	F	60.70	6.31	15	
15.7	6/11/13	W	52.62	15.70	68	
15.7	9/13/13	Sa	60.88	15.70	94	
10.5	12/15/13	M	54.92	10.52	93	
	(12/23/13)	Tu	57.00			Federal Reserve System begins
10.5	2/3/14	Tu	60.70	10.52	50	
6.3	4/25/14	Sa	56.17	6.33	81	
6.3	6/10/14	W	59.72	6.33	46	
	(6/27/14)	Sa	58.46			
	(6/29/14)	M	58.38			← Archduke Ferdinand assassinated
	(6/30/14)	Tu	58.86			
40.8	7/30/14	Th	52.12	40.76 ↑	50	Bull market begins





BEAR MARKET
21 November 1916 - 19 December 1917

FW	Date	Day	DJI	FW	Days
67.0	11/21/16	Tu	110.15	67.02	↓ 39
10.0	12/21/16	Th	90.16	10.00	30
10.0	1/3/17	W	99.18	10.00	13
13.9	2/2/17	F	87.01	13.87	↑ 30
10.2	3/20/17	Tu	98.20	10.24	46
	(4/5/17	Th	94.61)		
	(4/6/17	F	closed)		← U. S. declares war
	(4/7/17	S	93.10)		
10.2	5/9/17	W	89.08	10.24	50
13.9	6/9/17	Sa	99.08	13.87	↑ 31
5.9	9/4/17	Tu	81.20	5.93	87
5.9	9/25/17	Tu	86.02	5.93	21
6.2	10/15/17	M	75.13	6.21	20
6.2	10/20/17	Sa	79.80	6.21	5
8.2	11/8/17	Th	68.58	8.24	19
8.2	11/23/17	F	74.23	8.24	15
67.0	12/19/17	W	65.95	67.02	↑ 26

Bull Market begins

BEAR MARKET
3 November 1919 - 24 August 1921

FW	Date	Day	DJI	FW	Days
87.2	11/3/19	M	119.62	87.20	↓ 75
6.1	12/22/19	M	103.55	6.11	49
6.1	1/3/20	Sa	109.88	6.11	12
5.5	2/11/20	W	90.66	5.48	39
5.5	2/21/20	Sa	95.63	5.48	10
17.4	2/25/20	W	89.98	17.41	4
17.4	4/8/20	Th	105.65	17.41	43
8.2	5/19/20	W	87.36	8.18	41
8.2	7/8/20	Th	94.51	8.18	50
8.1	8/10/20	Tu	83.20	8.11	33
8.1	9/17/20	F	89.95	8.11	38
6.2	11/19/20	F	73.12	6.16	63
6.2	12/4/20	Sa	77.63	6.16	15
19.9	12/21/20	Tu	66.75	19.90	↓ 17
6.8	2/16/21	W	77.14	6.77	57
6.8	3/11/21	F	72.25	6.77	23
19.9	5/5/21	Th	80.03	19.90	↑ 55
7.8	6/20/21	M	64.90	7.78	46
7.8	8/2/21	Tu	69.95	7.78	43
87.2	8/24/21	W	63.90	87.20	↑ 22

Bull market begins

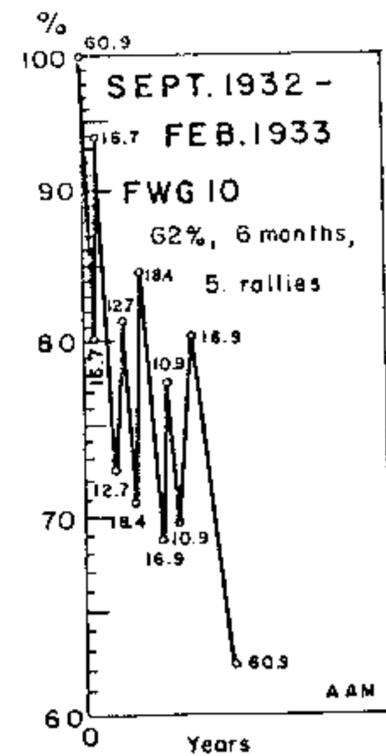
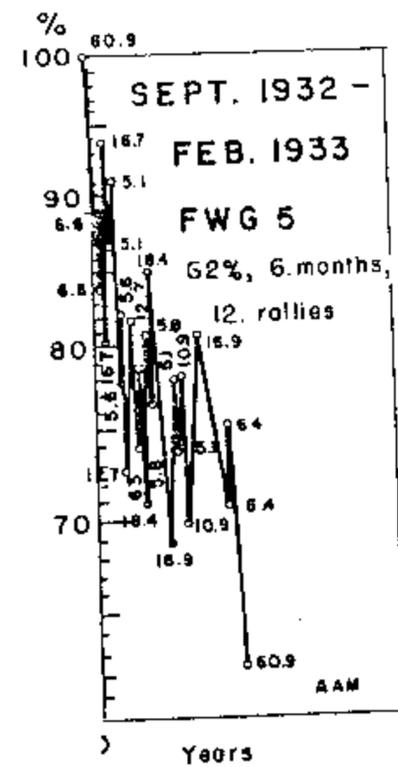
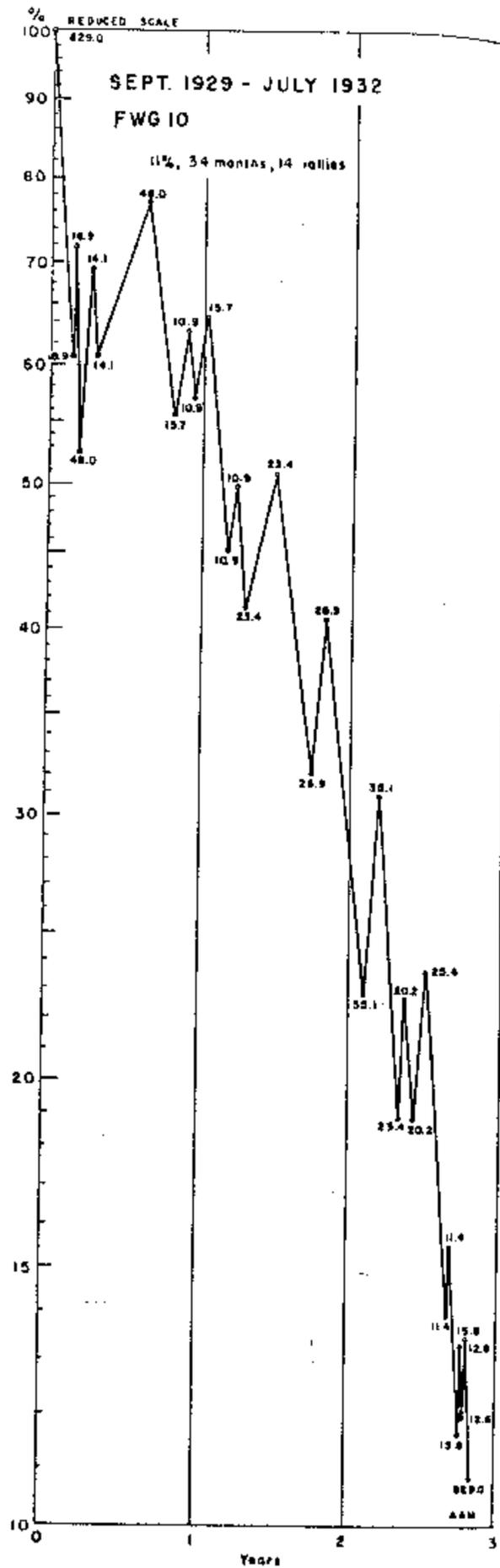
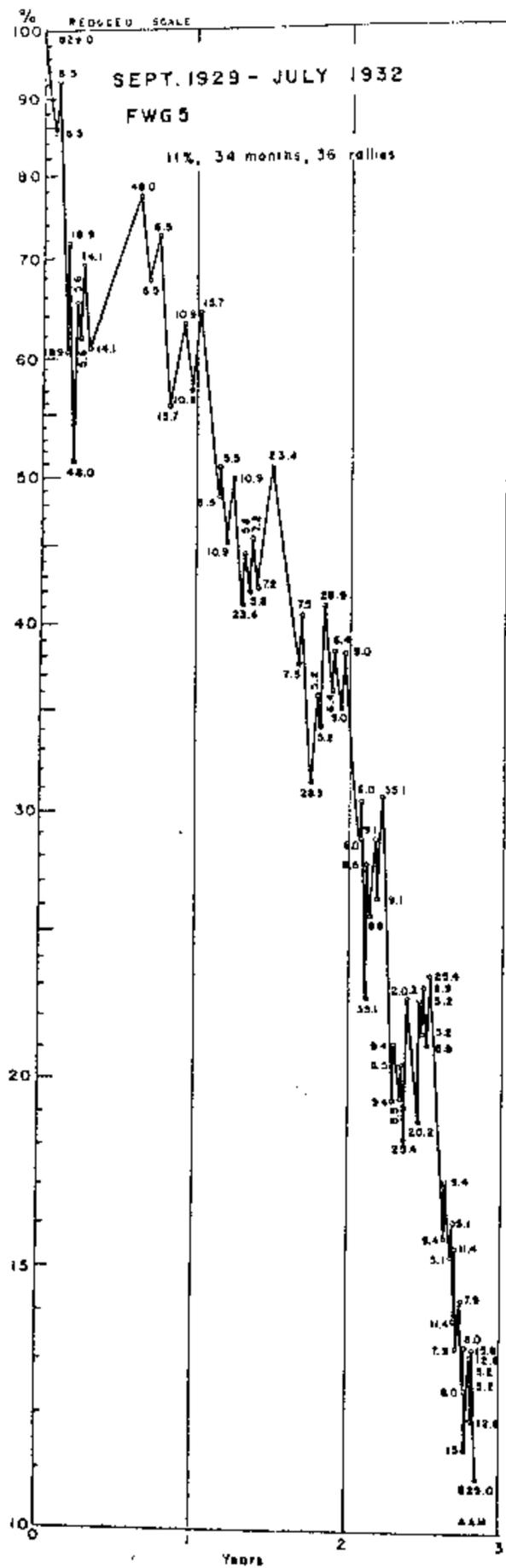
BEAR MARKET

3 September 1929 - 8 July 1932

FW	Date	Day	DJI	FW	Days	
329.0	9/3/29	Tu	381.17	829.0 ↓	25	Bear Market begins
8.5	10/4/29	F	325.17	8.51	31	
8.5	10/10/29	Th	352.86	8.51	6	
	(10/19/29)	Sa	323.87)			
	(10/21/29)	M	320.91)			Largest volume since March
	(10/22/29)	Tu	326.51)			
	(10/23/29)	W	305.85)			Hamilton's editorial "Turn of the Tide"
	(10/24/29)	Th	299.47)			Black Thursday -market demoralized -
	(10/25/29)	F	301.22)			volume 12,894,000. Low of 272.32.
	(10/26/29)	Sa	298.97)			
	(10/28/29)	M	260.64)			
18.9	10/29/29	Tu	230.07	18.88	19	Black Tuesday -volume
	(10/30/29)	W	258.47)			16,410,000
18.9	10/31/29	Th	273.51	18.88	2	
48.0	11/13/29	W	198.69	48.00 ↓	13	
5.6	11/21/29	Th	248.49	5.58	8	
5.6	11/26/29	Tu	235.35	5.58	5	
14.1	12/7/29	Sa	263.46	14.11	11	
14.1	12/20/29	F	230.89	14.11	13	
48.0	4/17/30	Th	294.07	48.00 ↑	118	
6.5	5/3/30	Sa	258.31	6.49	16	
6.5	5/29/30	Th	275.07	6.49	26	
15.7	6/24/30	Tu	211.84	15.70 ↓	26	
10.9	7/28/30	M	240.81	10.85	34	
10.9	8/12/30	Tu	217.24	10.85	15	
15.7	9/10/30	W	245.09	15.70 ↑	29	
5.5	10/22/30	W	184.98	5.46	42	
5.5	10/24/30	F	195.09	5.46	2	
10.9	11/10/30	M	171.60	10.90	17	
10.9	11/21/30	F	190.30	10.90	11	
23.4	12/16/30	Tu	157.51	23.40 ↓	25	
5.8	12/20/30	Sa	169.42	5.78	4	
5.8	12/29/30	M	160.16	5.78	9	
7.2	1/8/31	Th	173.04	7.18	10	
7.2	1/19/31	M	161.45	7.18	11	
23.4	2/24/31	Tu	194.36	23.40 ↑	36	
7.5	4/29/31	W	143.61	7.52	64	
7.5	5/8/31	F	154.41	7.52	9	
29.0	6/2/31	Tu	121.70	28.95 ↓	25	

Bear Market 1929-1932 continued:

FW	Date	Day	DJI	FW	Days	
5.2	6/13/31	Sa	137.03	5.16	11	
5.2	6/19/31	F	130.31	5.16	6	
29.0	6/27/31	Sa	156.93	28.95 ↑	8	
6.4	7/15/31	W	137.86	6.41	18	
6.4	7/21/31	Tu	146.70	6.41	6	
9.0	8/6/31	Th	133.77	9.00	16	
9.0	8/15/31	Sa	145.80	9.00	9	
6.0	9/22/31	Tu	109.40	6.03	38	
6.0	9/23/31	W	115.99	6.03	1	
35.1	10/5/31	M	86.48	35.05 ↓	12	
8.8	10/8/31	Th	105.79	8.76	3	
8.8	10/14/31	W	97.27	8.76	6	
9.1	10/24/31	Sa	109.70	9.13	10	
9.1	10/28/31	W	100.52	9.13	4	
35.1	11/9/31	M	116.79	35.05 ↑	12	
9.4	12/17/31	Th	73.79	9.43	38	
9.4	12/19/31	Sa	80.75	9.43	2	
5.5	12/28/31	M	73.84	5.50	9	
5.5	12/31/31	Th	77.90	5.50	3	
25.4	1/5/32	Tu	71.24	25.36 ↓	5	
20.2	1/15/32	F	85.88	20.15	10	
	(2/6/32)	Sa	74.45)			Averages computed 4 times per day
20.2	2/10/32	W	71.48	20.15	26	
5.2	2/13/32	Sa	85.82	5.21	3	
5.2	2/16/32	Tu	81.57	5.21	3	
8.9	2/19/32	F	87.41	8.91	3	
8.9	2/23/32	Tu	80.26	8.91	4	
25.4	3/8/32	Tu	89.31	25.36 ↑	14	
9.4	4/14/32	Th	59.75	9.36	37	
9.4	4/15/32	F	65.34	9.36	1	
5.1	4/25/32	M	58.55	5.07	10	
5.1	4/27/32	W	61.52	5.07	2	
11.4	5/4/32	W	52.95	11.44	7	
11.4	5/7/32	Sa	59.01	11.44	3	
7.9	5/16/32	M	50.68	7.93	9	
7.9	5/20/32	F	54.70	7.93	4	
6.1	5/31/32	Tu	44.74	6.06	11	
6.1	6/1/32	W	47.45	6.06	1	
15.8	6/2/32	Th	44.09	15.76 ↓	1	
12.6	6/4/32	Sa	50.88	12.57	2	
12.6	6/8/32	W	45.20	12.57	4	
5.2	6/11/32	Sa	50.38	5.18	3	
5.2	6/13/32	M	47.90	5.18	2	
15.8	6/16/32	Th	51.04	15.76 ↑	3	
829.0	7/8/32	F	41.03	829.00 ↑	22	Bull market begins



BEAR MARKET

8 September 1932 - 27 February 1933

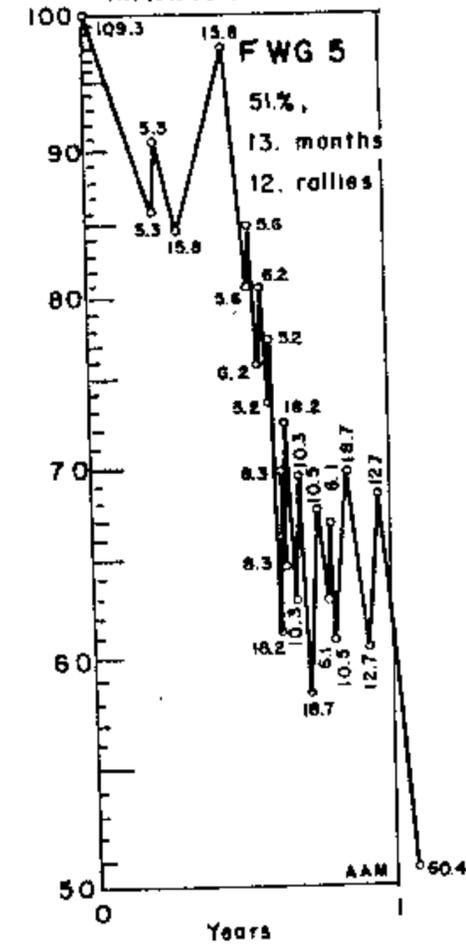
FW	Date	Day	DJI	FW	Days	
60.9	9/8/32	Th	80.68	60.85 ↓	8	Bear Market begins
6.6	9/13/32	Tu	67.45	6.58	5	
6.6	9/14/32	W	71.89	6.58	1	
16.7	9/20/32	Tu	64.84	16.66	6	
16.7	9/22/32	Th	75.64	16.66	2	
5.1	9/27/32	Tu	70.18	5.14	5	
5.1	9/29/32	Th	73.79	5.14	2	10/1/32 averages computed hourly
5.6	10/7/32	F	62.67	5.63	8	
5.6	10/8/32	Sa	66.20	5.63	1	
12.7	10/10/32	M	58.47	12.74	2	
12.7	10/20/32	Th	65.92	12.74	10	
6.3	10/26/32	W	59.55	6.30	6	
6.3	10/29/32	Sa	63.30	6.30	3	
18.4	11/3/32	Th	57.26	18.35 ↓	5	
5.8	11/9/32	W	65.10	5.75	6	
5.8	11/10/32	Th	61.56	5.75	1	
18.4	11/12/32	Sa	68.12	18.35 ↑	2	
16.9	12/3/32	Sa	55.48	16.91 ↑	21	
5.1	12/12/32	M	62.30	5.06	9	
5.1	12/14/32	W	59.30	5.06	2	
10.9	12/15/32	Th	62.55	10.90	1	
10.9	12/23/32	F	56.40	10.90	8	
16.9	1/11/33	W	64.86	16.91 ↑	19	
6.4	2/6/33	M	56.93	6.36	26	
6.4	2/9/33	Th	60.55	6.36	3	
60.9	2/27/33	M	50.16	60.85 ↑	18	Bull market begins

BEAR MARKET

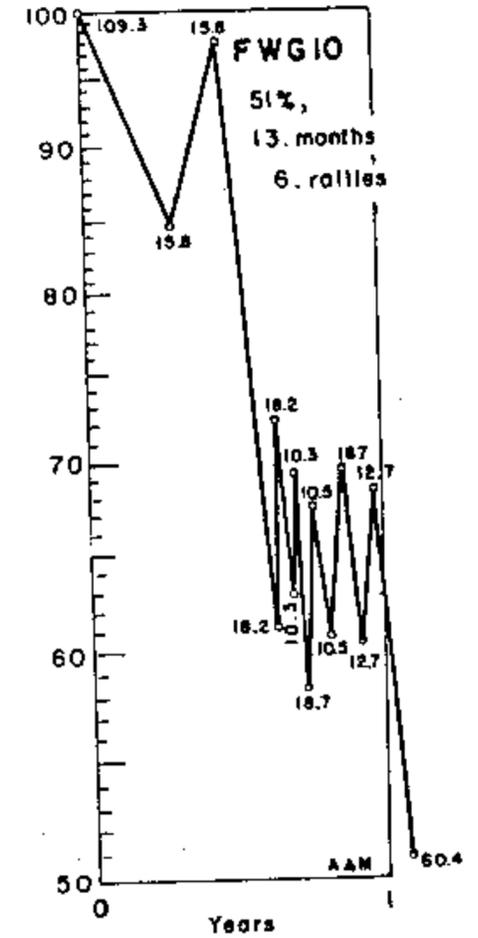
6 March 1937 - 31 March 1938

FW	Date	Day	DJI	FW	Days	
109.3	3/6/37	Sa	194.47	109.29	105	Bear Market begins
5.3	5/18/37	Tu	166.77	5.31	73	
5.3	5/24/37	M	175.62	5.31	6	
15.8	6/17/37	Th	164.07	15.82	24	
15.8	8/14/37	Sa	190.02	15.82	58	
5.6	9/13/37	M	155.96	5.64	30	
5.6	9/16/37	Th	164.75	5.64	3	
6.2	9/24/37	F	147.38	6.15	8	
6.2	9/30/37	Th	156.44	6.15	6	
5.2	10/6/37	W	142.33	5.21	6	
5.2	10/7/37	Th	149.74	5.21	1	
18.2	10/19/37	Tu	118.84	18.20 ↓	12	
8.3	10/21/37	Th	135.73	8.26	2	
8.3	10/25/37	M	125.37	8.26	4	
18.2	10/29/37	F	140.47	18.20 ↑	4	
10.3	11/8/37	M	122.31	10.26	10	
10.3	11/12/37	F	134.86	10.26	4	
18.7	11/23/37	Tu	113.52	18.71 ↓	11	
10.5	12/8/37	W	130.66	10.51 ↓	15	
6.1	12/14/37	Tu	122.46	6.14	6	
6.1	12/21/37	Tu	129.98	6.14	7	
10.5	12/29/37	W	118.23	10.51 ↑	8	
18.7	1/12/38	W	134.76	18.71 ↑	14	
12.7	2/4/38	F	117.50	12.69	23	
12.7	2/23/38	W	132.41	12.69	19	
	(3/10/38	Th	124.71)			
	(3/11/38	F	122.44) ← Hitler invades Austria			
	(3/12/38	Sa	122.58)			
	(3/17/38	Th	122.03)			
	(3/18/38	F	118.41) Mexico nationalizes oil			
	(3/19/38	Sa	120.43)			
60.4	3/31/38	Th	98.75	60.42 ↓	36	Bull market begins

% MAR. 1937 - MAR. 1938



% MAR. 1937 - MAR. 1938



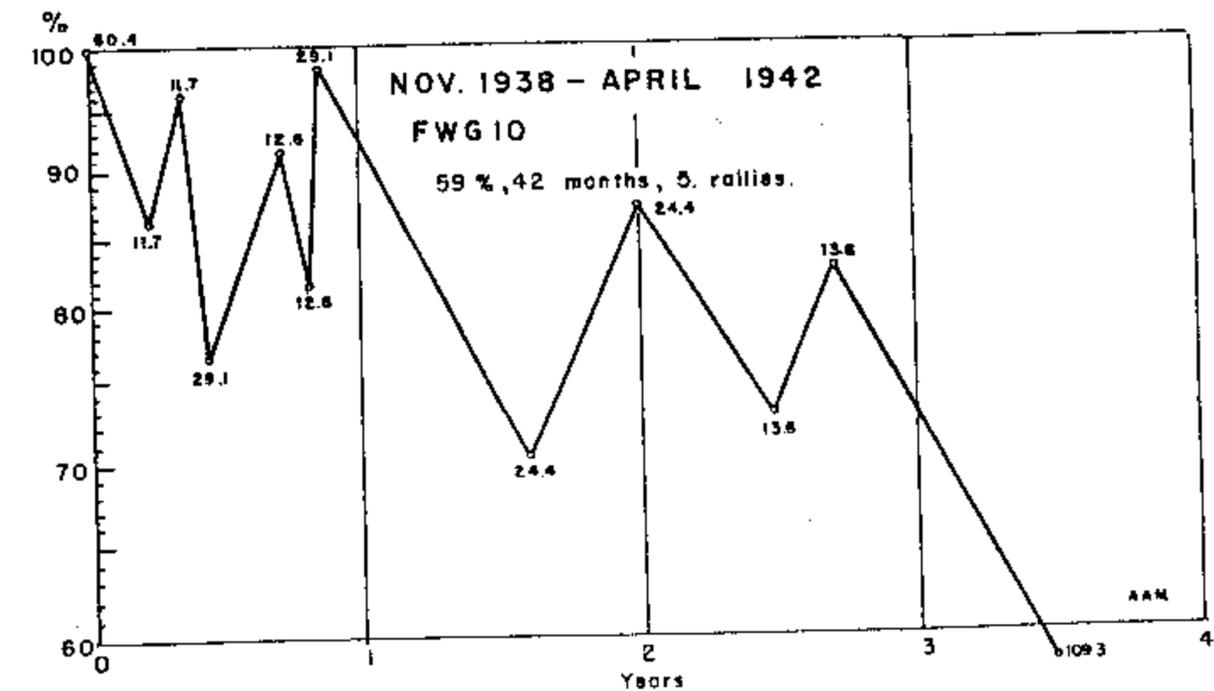
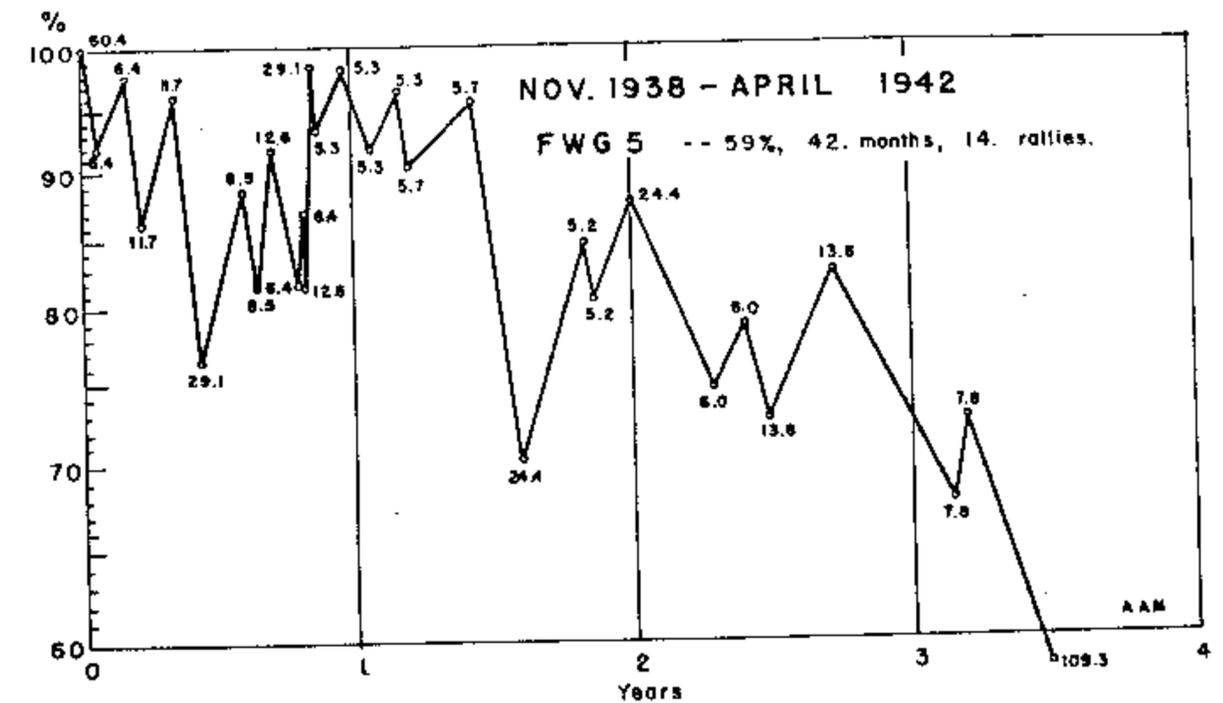
BEAR MARKET

10 November 1938 - 28 April 1942

FW	Date	Day	DJI	FW	Days	
60.4	11/10/38	Th	158.41	60.42	43	Bear Market begins.
6.4	11/28/38	M	145.67	6.36	18	
6.4	1/5/39	Th	154.94	6.36	38	
11.7	1/26/39	Th	136.42	11.71	21	
11.7	3/10/39	F	152.40	11.71	43	
29.1	4/11/39	Tu	120.82	29.12 ↓	32	
8.5	6/10/39	Sa	140.33	8.48	60	
8.5	6/30/39	F	129.36	8.48	20	
12.6	7/25/39	Tu	145.43	12.56 ↓	25	
6.4	8/24/39	Th	129.53	6.39	30	
6.4	8/30/39	W	137.81	6.39	6	
	8/31/39	Th	134.41)			
12.6	9/1/39	F	129.20	12.56 ↑	2	Germany invades Poland
	(9/2/39	Sa	138.09)			
	(9/3/39	Su	closed)			Great Britain and France declare war
	(9/4/39	M	closed)			on Germany
	(9/5/39	Tu	148.12)			
29.1	9/13/39	W	156.00	29.12 ↑	12	
5.3	9/18/39	M	147.78	5.29	5	
5.3	10/26/39	Th	155.60	5.29	38	
5.3	11/30/39	Th	145.33	5.29	35	
5.3	1/4/40	Th	153.02	5.29	35	
5.7	1/15/40	M	143.41	5.71	11	
	(4/8/40	M	151.29)			
	4/9/40	Tu	151.60	5.71	85	Germans invade Norway
	(4/10/40	W	149.59)			and Denmark
	(5/11/40	Sa	144.85)			

Bear Market 1938-1942 continued:

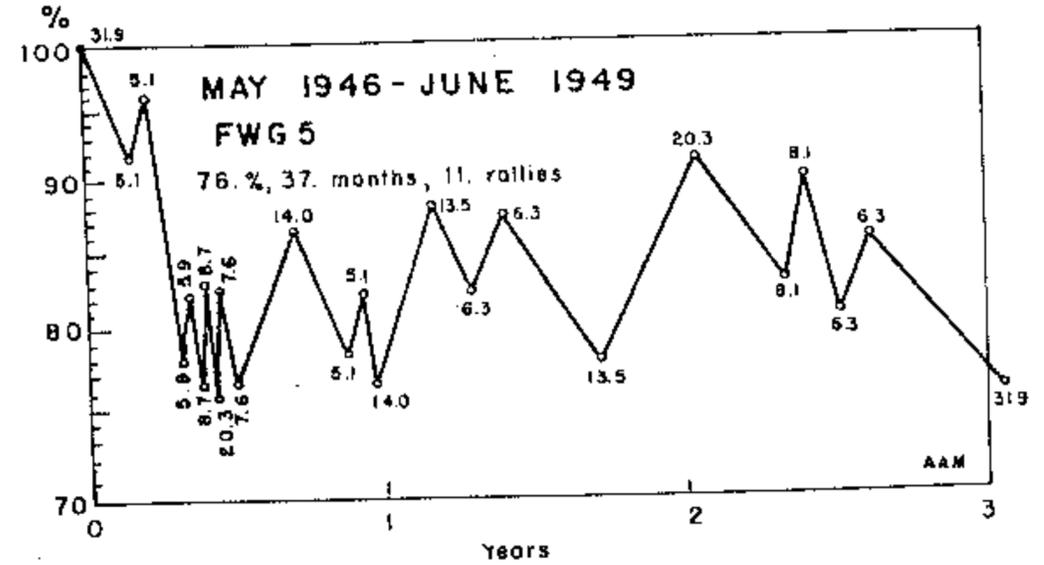
FW	Date	Day	DJI	FW	Days
	(5/12/40	Su	closed)		Germans cross French frontier
	(5/13/40	M	137.63)		
	(6/8/40	Sa	115.36)		
24.4	6/10/40	M	111.29	24.42 ↓	62 Italy declares war on France and Britain
	(6/11/40	Tu	115.97)		
	(6/14/40	F	122.27)		
	(6/15/40	Sa	123.36)		Germans enter Paris
	(6/17/40	M	122.80)		
	(7/9/40)	Tu	121.60)		
	(7/10/40	W	121.49)		Bombing of Britain begins
	(7/11/40	Th	121.58)		
5.2	9/5/40	Th	134.11	5.15	87
5.2	9/13/40	F	127.54	5.15	8
24.4	11/8/40	F	138.47	24.42 ↑	56
6.0	2/19/41	W	117.71	6.02	103
6.0	4/4/41	F	124.80	6.02	44
13.6	5/1/41	Th	115.02	13.64	27
	(6/21/41	Sa	122.51)		
	(6/22/41	Su	closed)		Germans invade Russia
	(6/23/41	M	123.97)		
13.6	7/22/41	Tu	130.71	13.64	82
	(12/6/41	Sa	116.70)		
	(12/7/41	Su	closed)		Pearl Harbor attacked
	(12/8/41	M	112.52)		U.S. and Britain declare war on Japan
	(12/9/41	Tu	109.27)		
	(12/10/41	W	109.01)		
	(12/11/41	Th	110.91)		← U.S. declares war on Germany and Italy
	(12/12/41	F	110.58)		
7.8	12/23/41	Tu	106.22	7.78	154
	(1/5/42	M	114.22)		
7.8	1/6/42	Tu	114.48	7.78	14 Japan takes Manila
	(1/7/42	W	113.10)		
	(4/8/42	W	101.23)		
	(4/9/42	Th	99.69)		U.S. Forces on Bataan surrender
	(4/10/42	F	99.74)		
109.3	4/28/42	Tu	92.92	109.29 ↑	112 Bull market begins

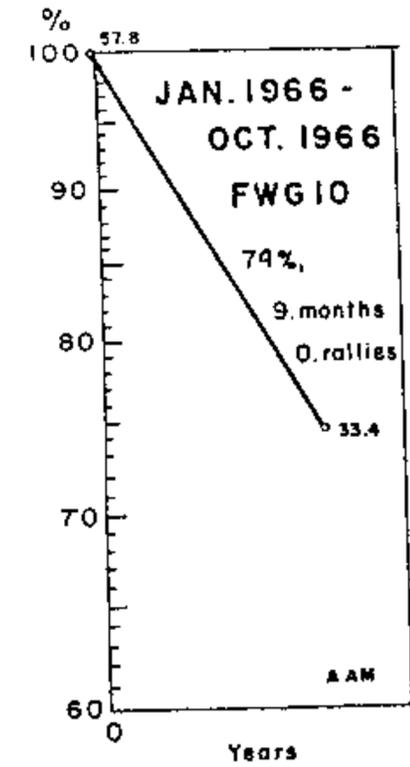
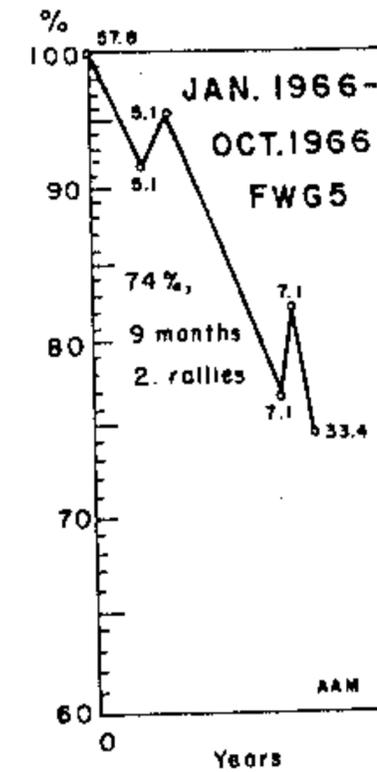
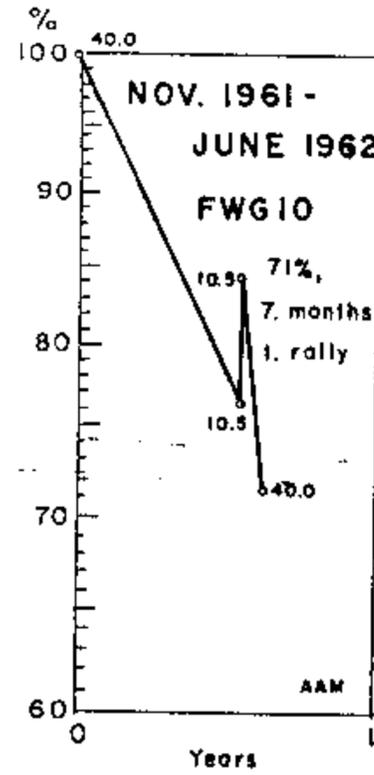
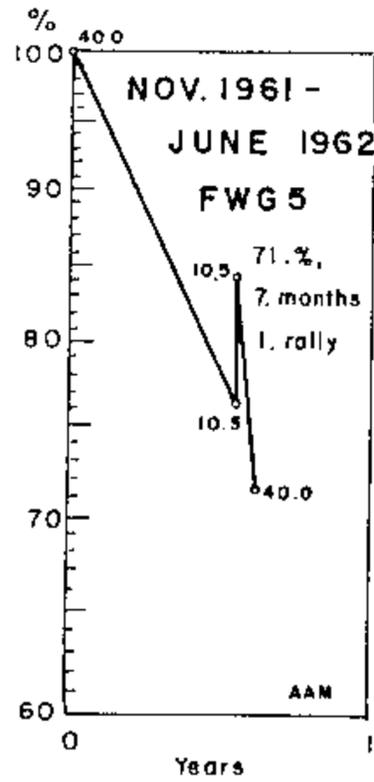


BEAR MARKET

29 May 1946 - 14 June 1949

FW	Date	Day	DJI	FW	Days	
31.9	5/29/46	W	212.50	31.91	92	Bear Market begins
5.1	7/24/46	W	194.90	5.10	56	
5.1	8/14/46	W	204.84	5.10	21	
5.9	9/19/46	Th	165.17	5.93	36	
5.9	9/26/46	Th	174.96	5.93	7	
8.7	10/10/46	Th	162.28	8.68	14	
8.7	10/16/46	W	176.37	8.68	6	
20.3	10/30/46	W	161.11	20.30 ↓	14	
7.6	11/4/46	M	175.34	7.60	5	
7.6	11/22/46	F	162.96	7.60	18	
14.0	2/10/47	M	184.54	14.03 ↓	80	
5.1	4/15/47	Tu	166.16	5.07	64	
5.1	5/5/47	M	174.58	5.07	20	
14.0	5/19/47	M	161.84	14.03 ↑	14	
13.5	7/25/47	F	187.05	13.52 ↓	67	
6.3	9/9/47	Tu	174.62	6.32	46	
6.3	10/20/47	M	185.66	6.32	41	
13.5	2/11/48	W	164.77	13.52 ↑	114	
	(3/13/48)	Sa	167.62)			
	(3/15/48)	M	167.62)			Coal strike
	(3/16/48)	Tu	165.39)			
20.3	6/14/48	M	193.81	20.30 ↑	124	
8.1	9/28/48	Tu	175.98	8.14	106	
8.1	10/23/48	Sa	190.30	8.14	25	
6.3	11/30/48	Tu	171.20	6.31	38	
6.3	1/7/49	F	182.00	6.31	38	
31.9	6/14/49	Tu	161.10	31.91 ↑	158	Bull market begins





BEAR MARKET

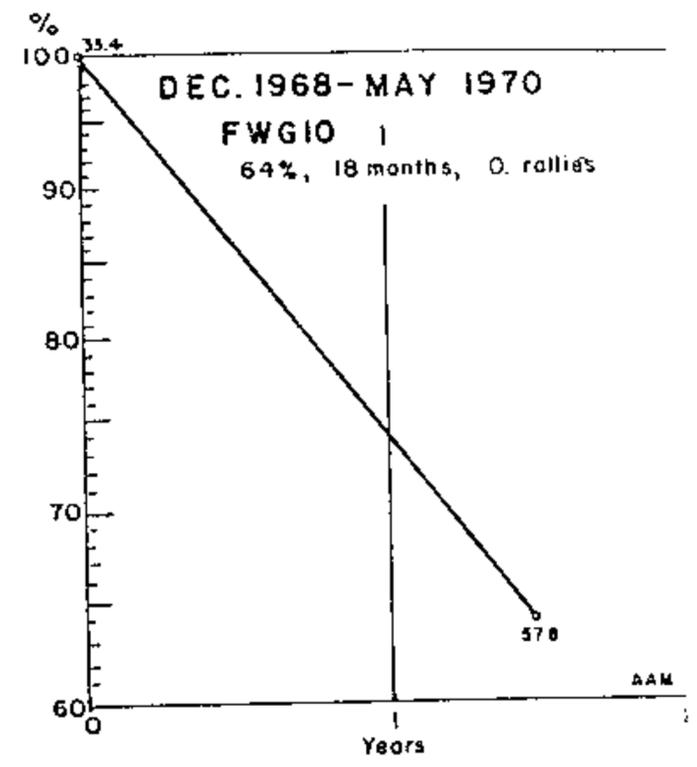
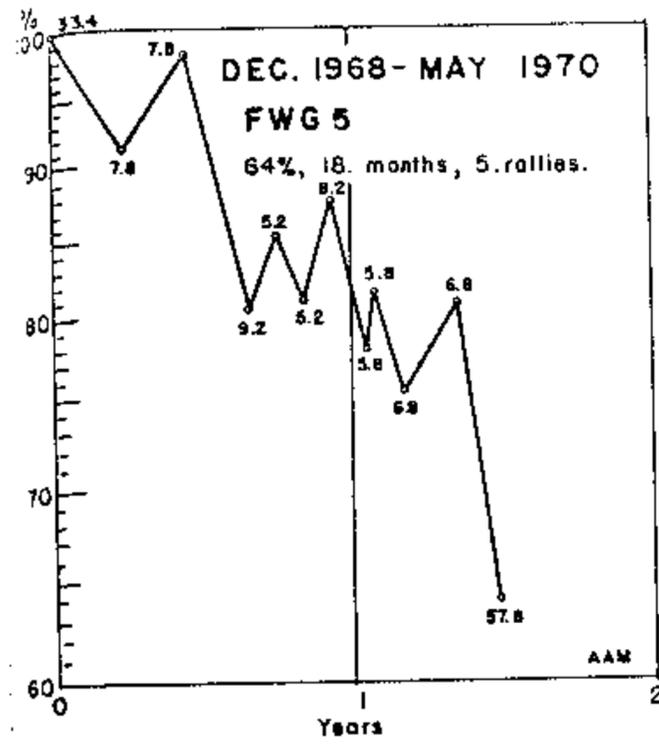
15 November 1961 - 25 June 1962

FW	Date	Day	DJI	FW	Days	
40.0	11/15/61	W	737.50	40.03	51	Bear Market begins
10.5	5/29/62	Tu	561.75	10.47	195	
10.5	5/31/62	Th	620.54	10.47	2	
40.0	6/25/62	M	526.69	40.03	25	Bull Market begins

BEAR MARKET

19 January 1966 - 10 October 1966

FW	Date	Day	DJI	FW	Days	
57.8	1/19/66	W	995.87	57.78	204	Bear Market begins
5.1	3/15/66	Tu	908.79	5.13	55	
5.1	4/21/66	Th	955.45	5.13	37	
7.1	8/30/66	Tu	762.52	7.14	131	
7.1	9/16/66	F	816.98	7.14	17	
33.4	10/10/66	M	740.03	33.37	24	← Bull market begins



BEAR MARKET

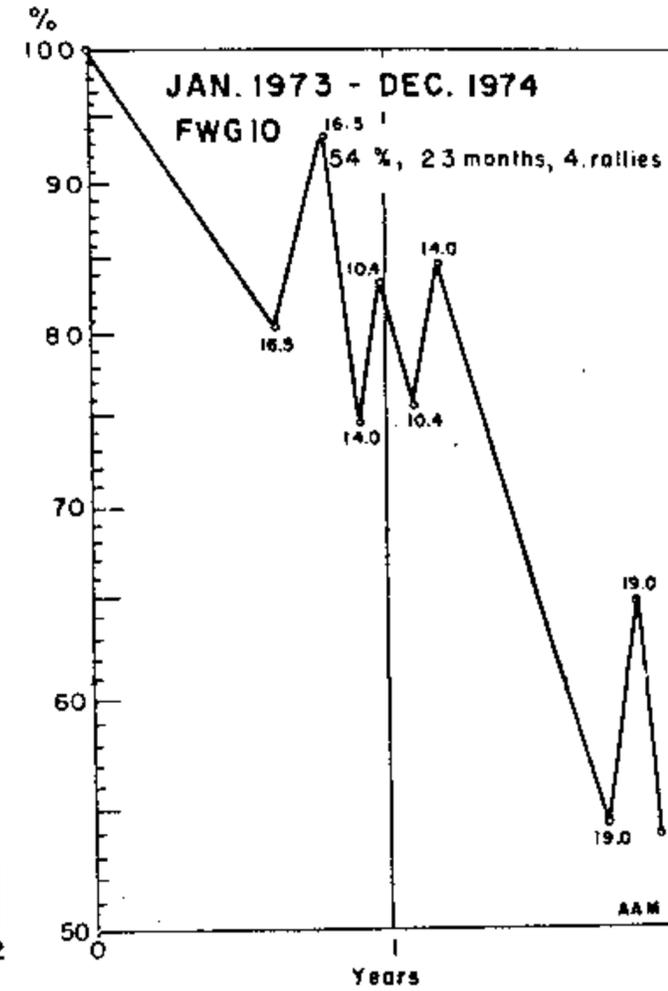
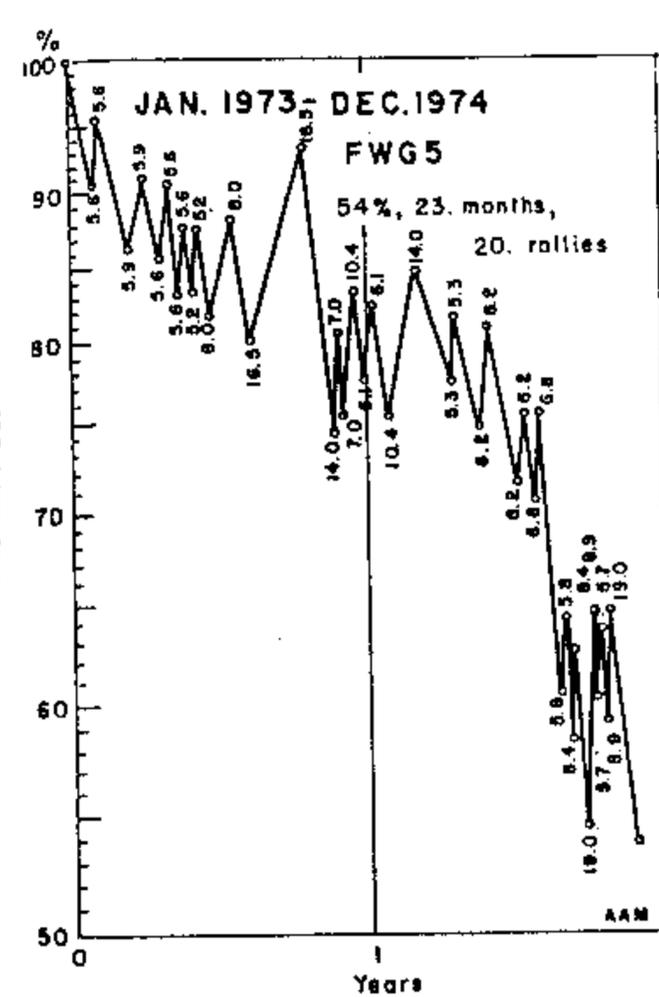
2 December 1968 - 26 May 1970

FW	Date	Day	DJI	FW	Days	
33.4	12/2/68	M	987.01	33.37	115	Bear Market begins.
7.8	2/26/69	W	898.99	7.77	86	
7.8	5/14/69	W	968.85	7.77	77	7/20/69 First moon landing
9.2	7/30/69	W	792.85	9.19 ↓	77	
5.2	9/2/69	Tu	839.76	5.25	34	
5.2	10/9/69	Th	797.85	5.25	37	
9.2	11/10/69	M	865.69	9.19 ↑	32	
5.8	12/18/69	Th	767.82	5.81	38	
5.8	1/5/70	M	812.43	5.81	18	
6.8	2/3/70	Tu	743.40	6.85	29	
6.8	4/9/70	Th	794.35	6.85	65	4/30/70 Cambodian invasion
57.8	5/26/70	Tu	631.16	57.78	47	Bull Market begins

BEAR MARKET

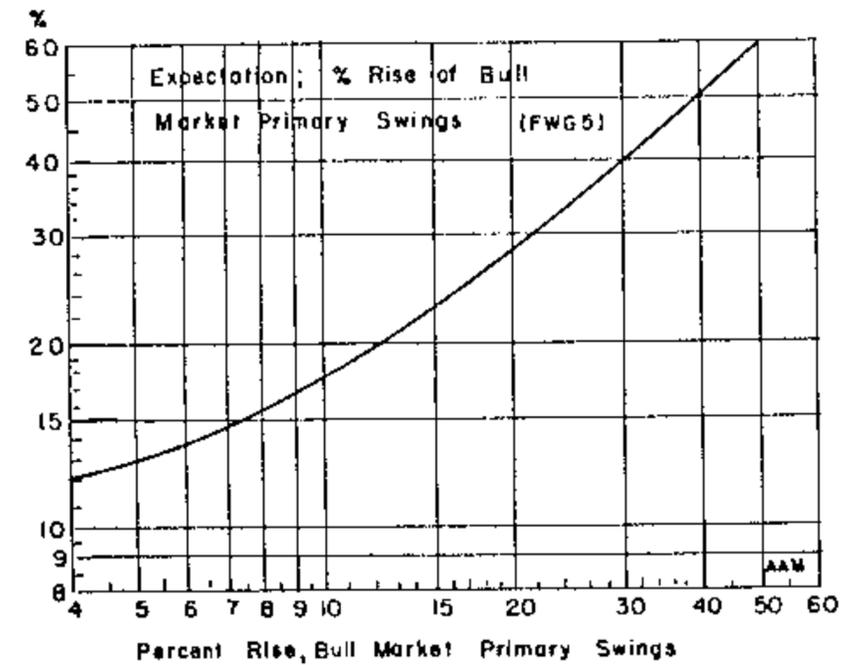
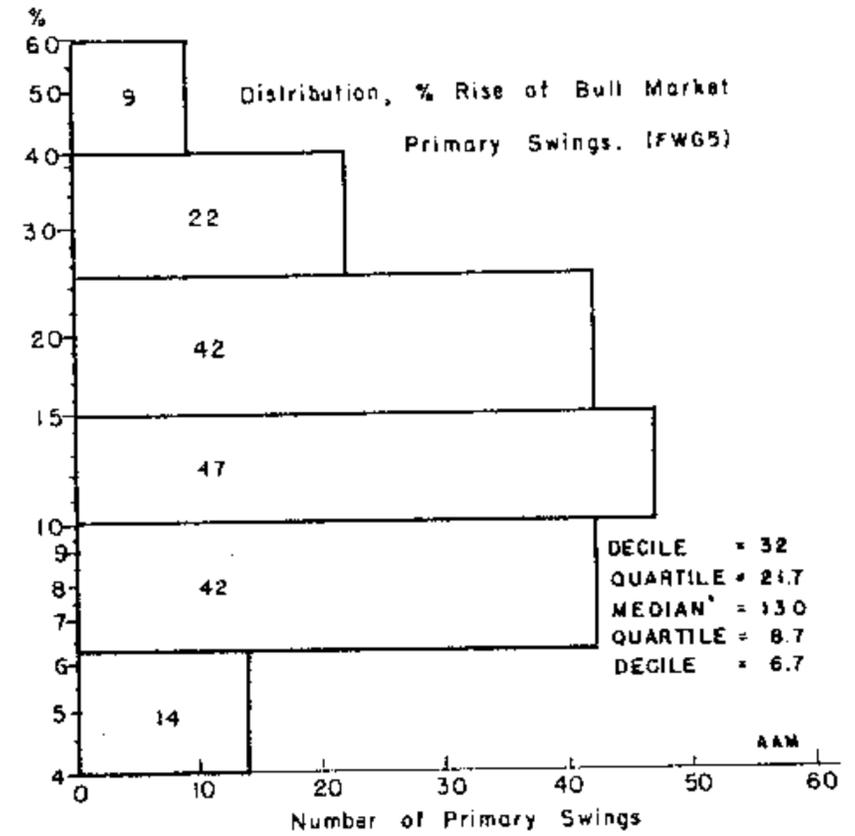
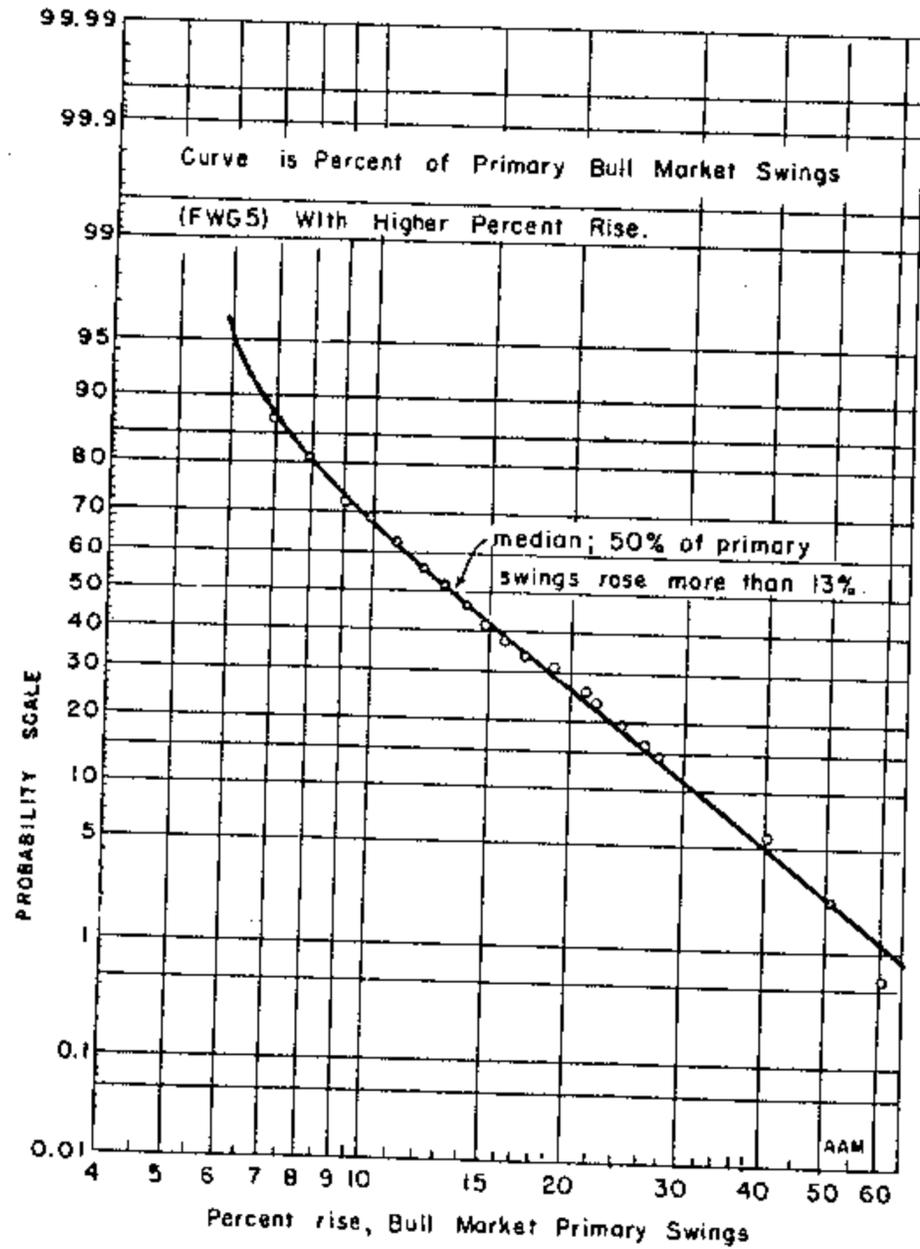
11 January 1973 - 9 December 1974

FW	Date	Day	DJI	FW	Days	Events
	1/11/73	Th	1061.14		86	Bear Market begins
5.6	2/8/73	Th	960.42	5.65	28	1/23/73 Vietnam cease fire
5.6	2/13/73	Tu	1014.67	5.65	5	2/12/73 Dollar devalued
5.9	3/23/73	F	915.19	5.91	38	
5.9	4/12/73	Th	969.30	5.91	20	
5.6	5/1/73	Tu	908.41	5.61	19	
5.6	5/19/73	W	959.36	5.61	8	
5.6	5/21/73	M	881.32	5.62	12	5/17/73 Watergate televised
5.6	5/25/73	F	930.84	5.62	4	
5.2	6/4/73	M	884.86	5.15	10	
5.2	6/13/73	W	930.39	5.15	9	Price freeze
8.0	6/26/73	Tu	868.15	8.04	13	
8.0	7/30/73	M	937.99	8.04	34	
16.5	8/22/73	W	850.02	16.50	23	
16.5	10/29/73	M	990.29	16.50	68	
14.0	12/5/73	W	788.31	14.00	37	
7.0	12/11/73	Tu	856.24	7.02	6	
7.0	12/13/73	Th	800.05	7.02	2	
10.4	1/4/74	F	882.38	10.36	22	
6.1	1/10/74	Th	822.65	6.10	6	
6.1	1/23/74	W	872.85	6.10	13	
10.4	2/12/74	Tu	799.58	10.36	20	
14.0	3/14/74	Th	898.70	14.00	30	
5.3	4/25/74	Th	823.37	5.32	42	
5.3	5/10/74	F	867.18	5.32	15	
8.2	5/30/74	Th	794.20	8.24	20	
8.2	6/10/74	M	859.67	8.24	11	
6.2	7/11/74	Th	759.00	6.16	31	
6.2	7/24/74	W	805.77	6.16	13	
6.8	8/5/74	M	749.69	6.83	12	
6.8	8/8/74	Th	800.92	6.83	3	
5.8	9/4/74	W	642.99	5.79	27	Nixon resigns
5.8	9/6/74	F	680.23	5.79	2	
8.4	9/16/74	M	623.36	8.36	10	
8.4	9/19/74	Th	675.45	8.36	3	
19.0	10/4/74	F	577.99	19.00	15	
8.9	10/14/74	M	683.98	8.89	10	
5.7	10/17/74	Th	639.47	5.70	3	
5.7	10/22/74	Tu	675.92	5.70	5	
8.9	10/28/74	M	628.13	8.89	6	
19.0	11/6/74	W	687.81	19.00	9	
	12/9/74	M	572.20		33	Bull Market begins



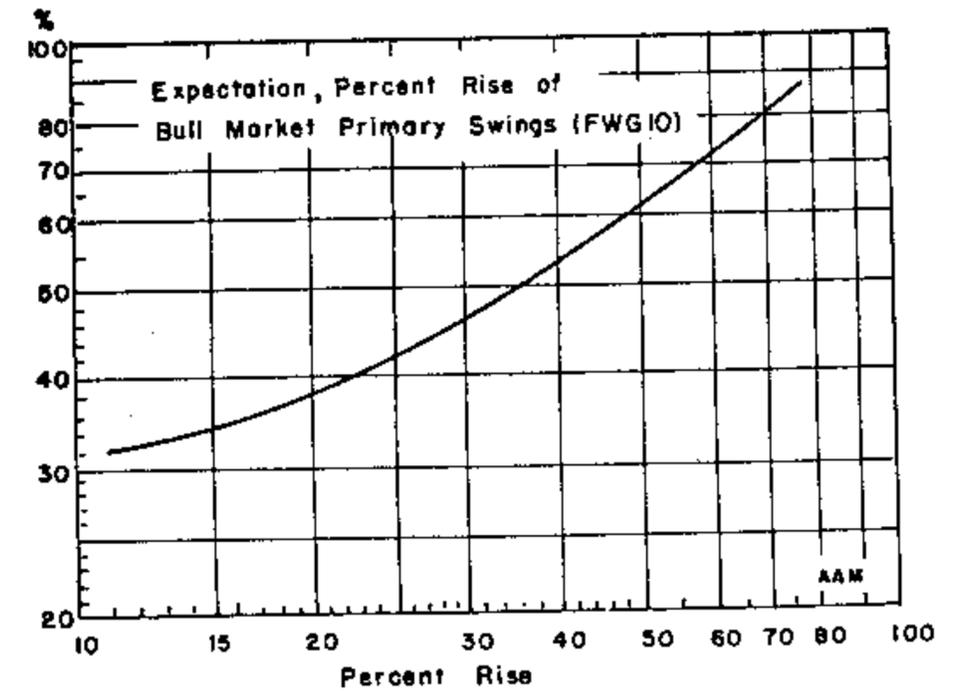
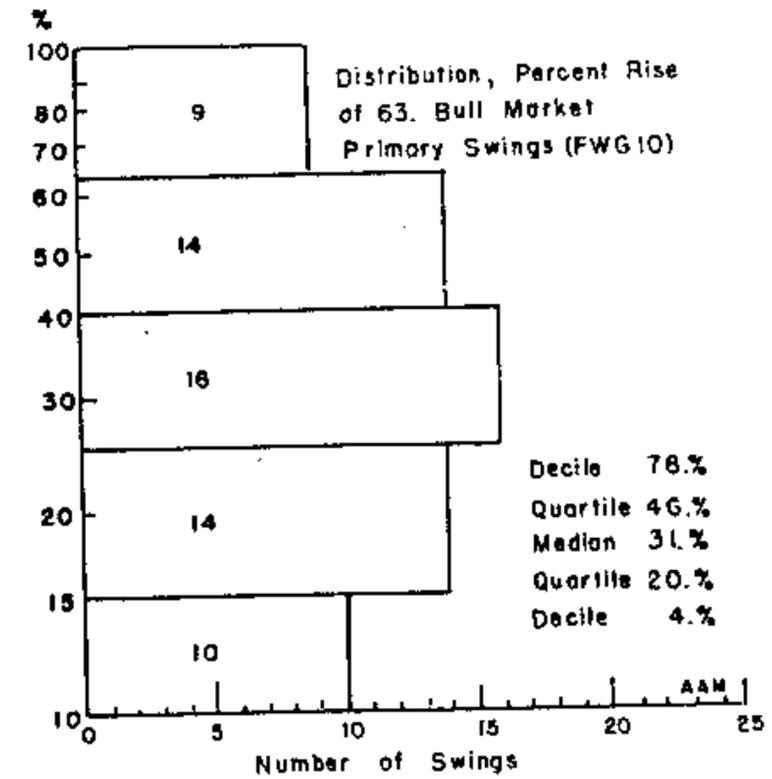
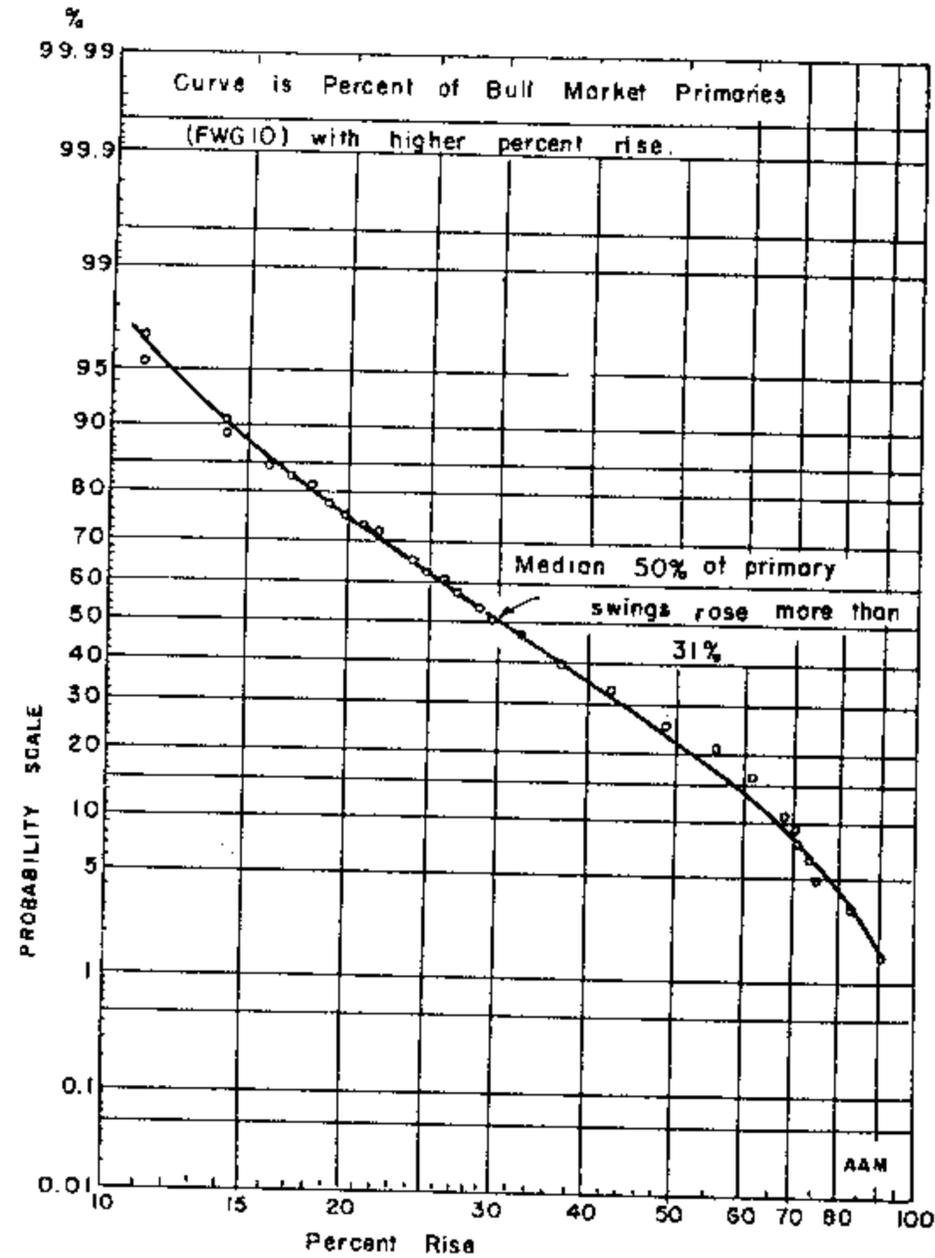
Appendix IV

BULL PRIMARY - PERCENT SWING
FWG 5



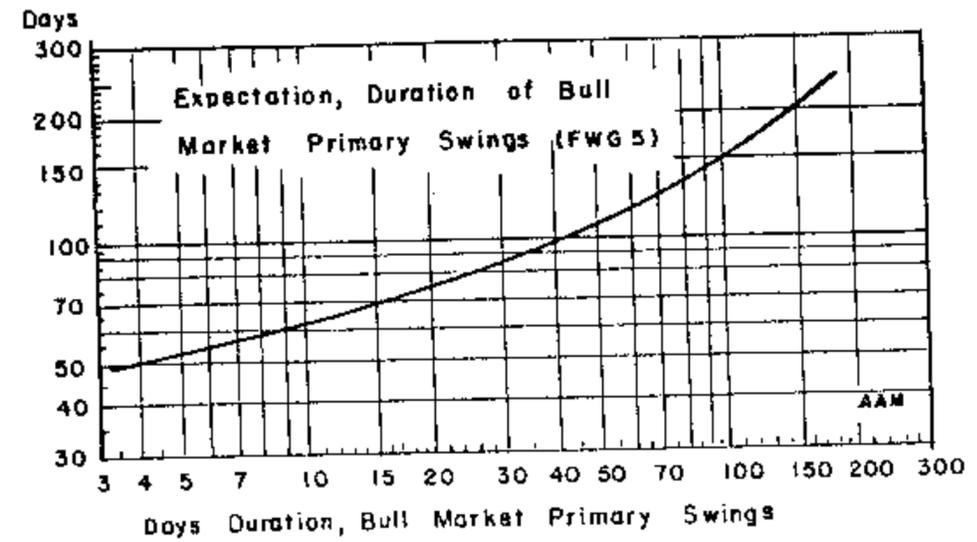
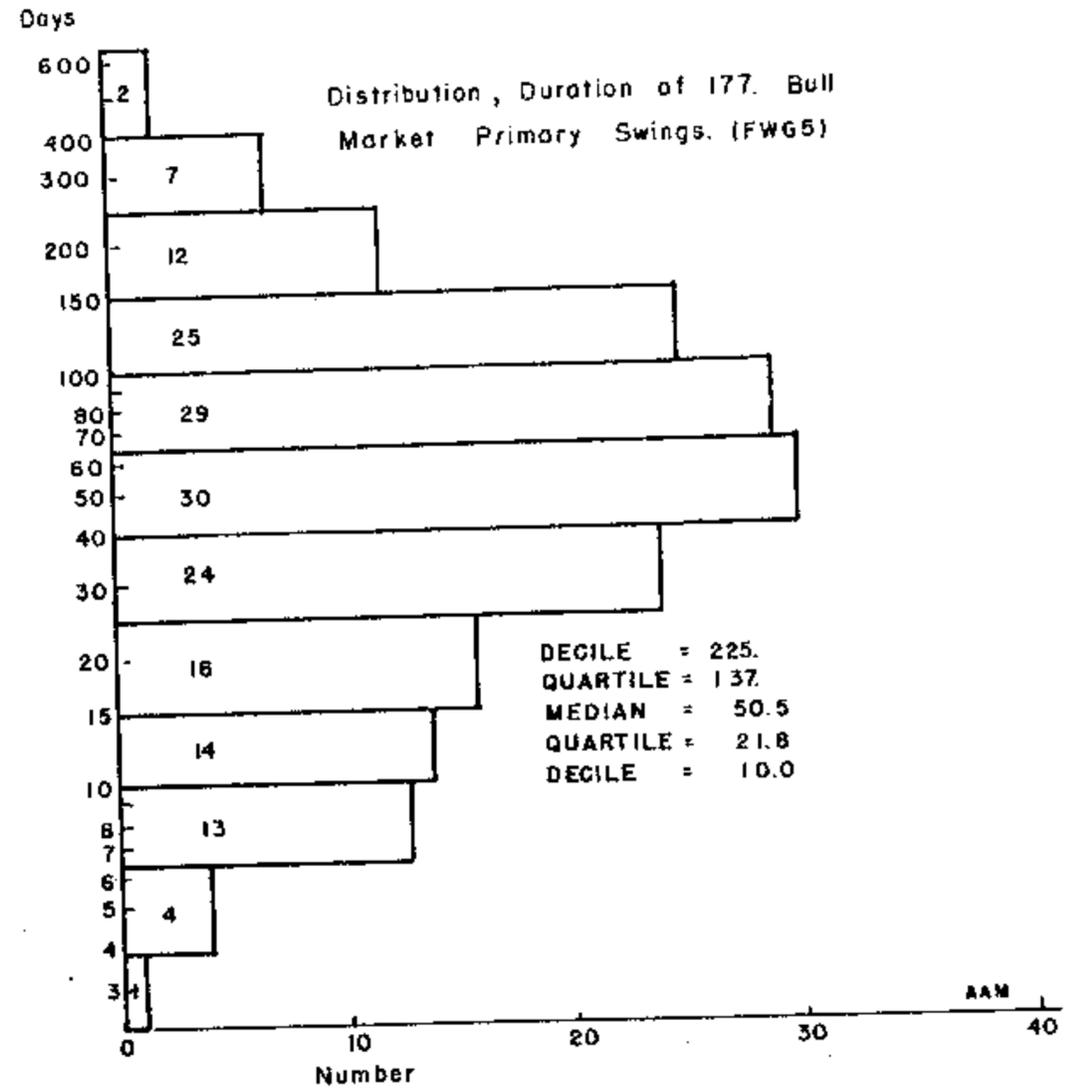
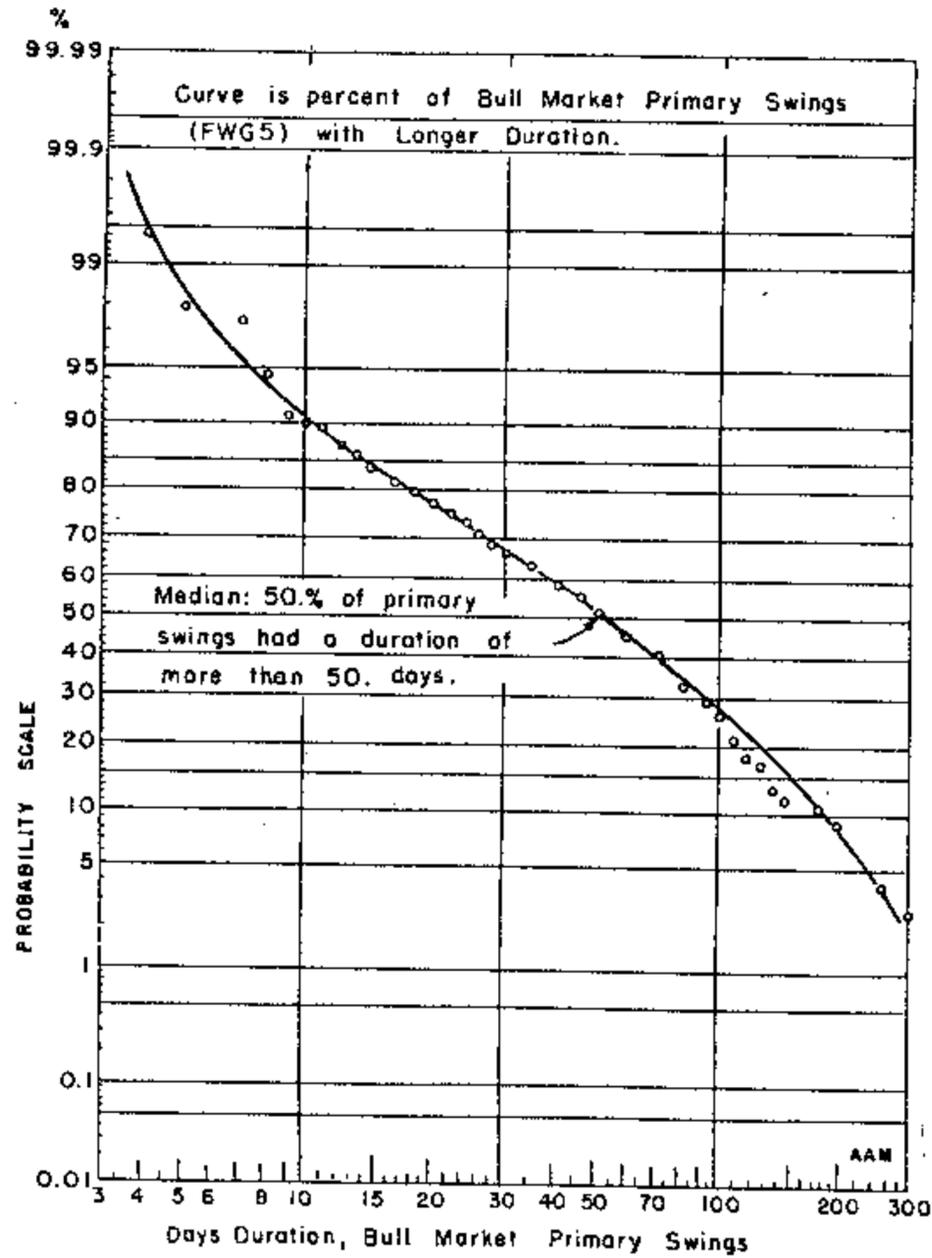
Appendix IV

BULL PRIMARY - PERCENT SWING
FWG 10



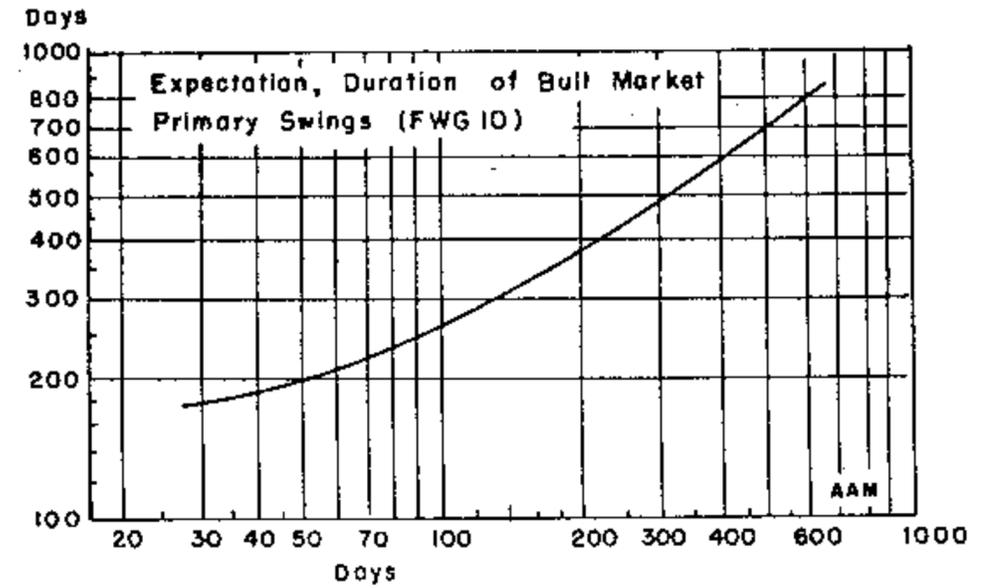
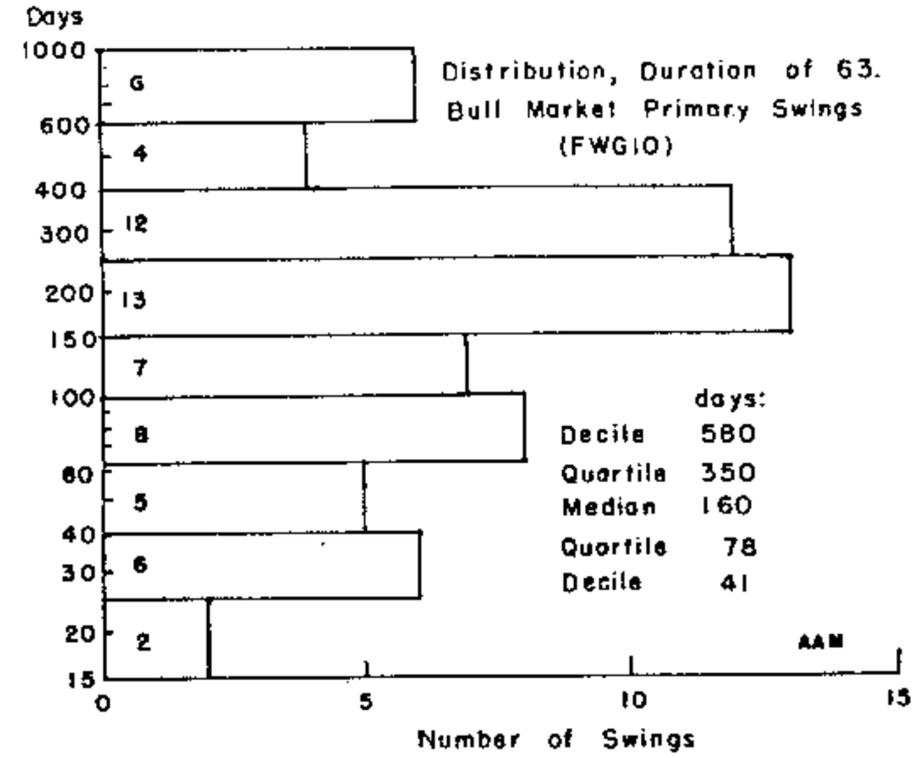
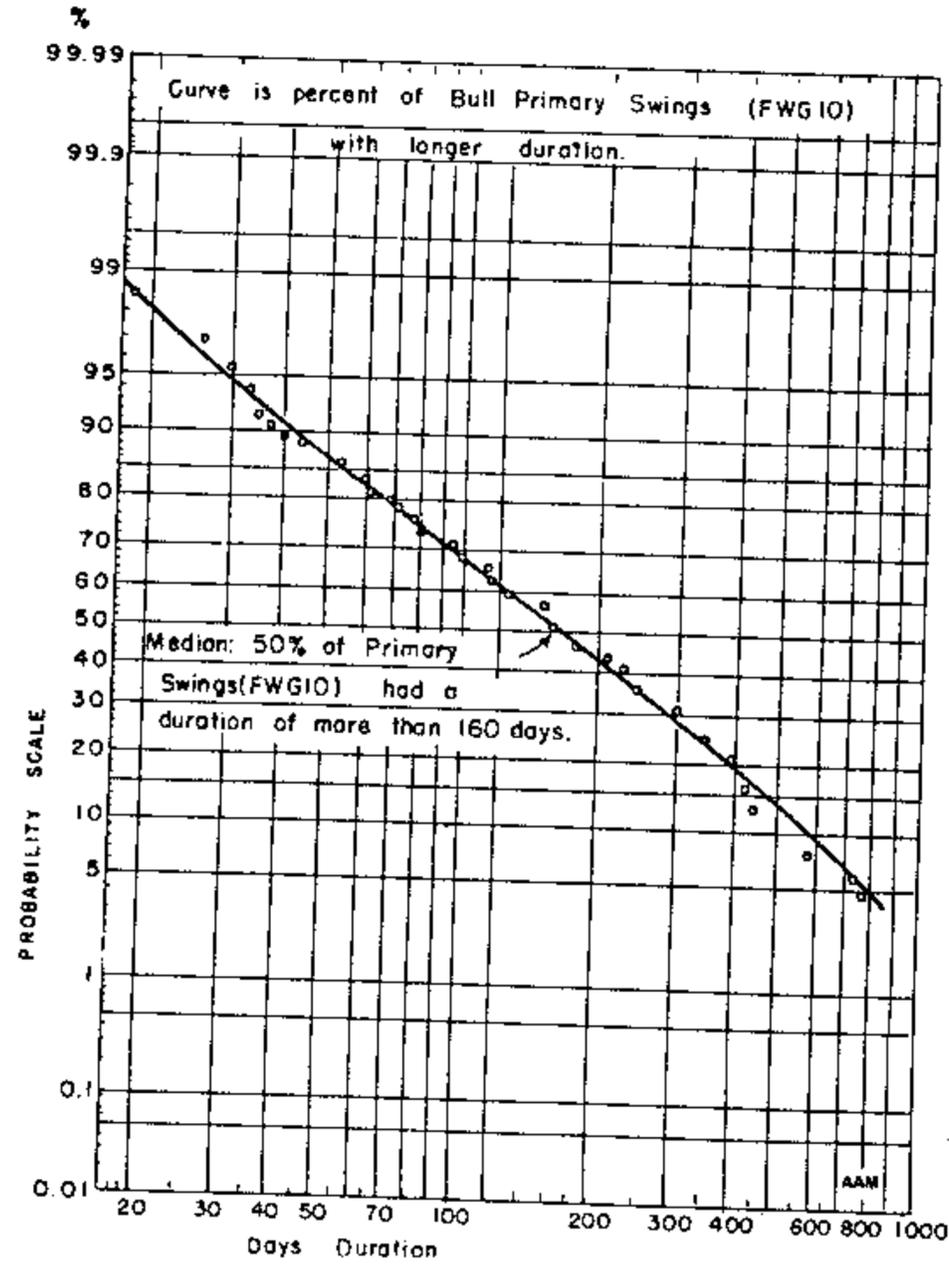
Appendix IV

BULL PRIMARY - DURATION
FWG 5



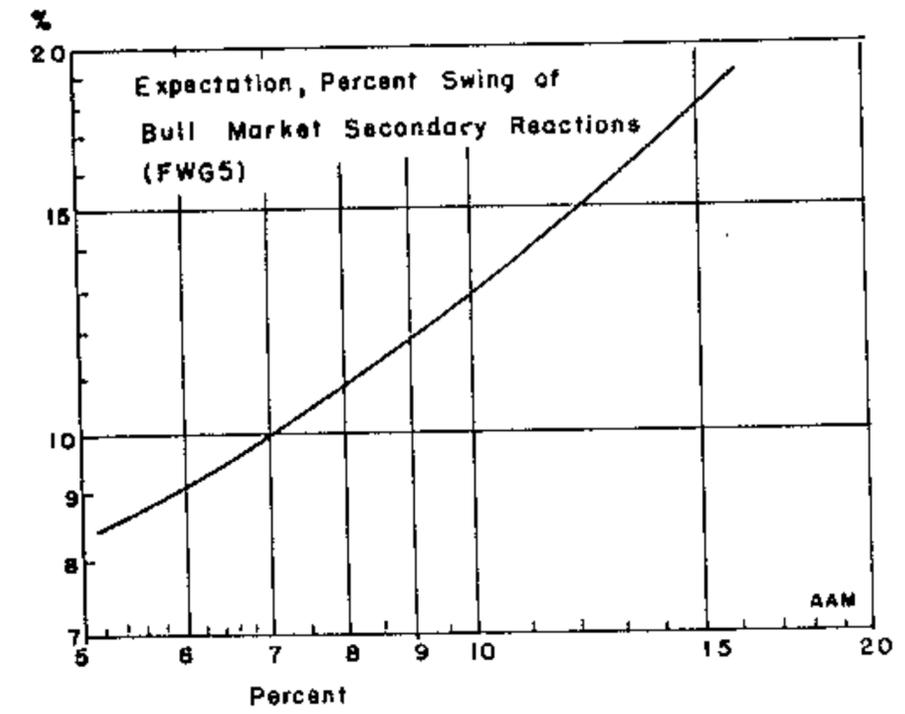
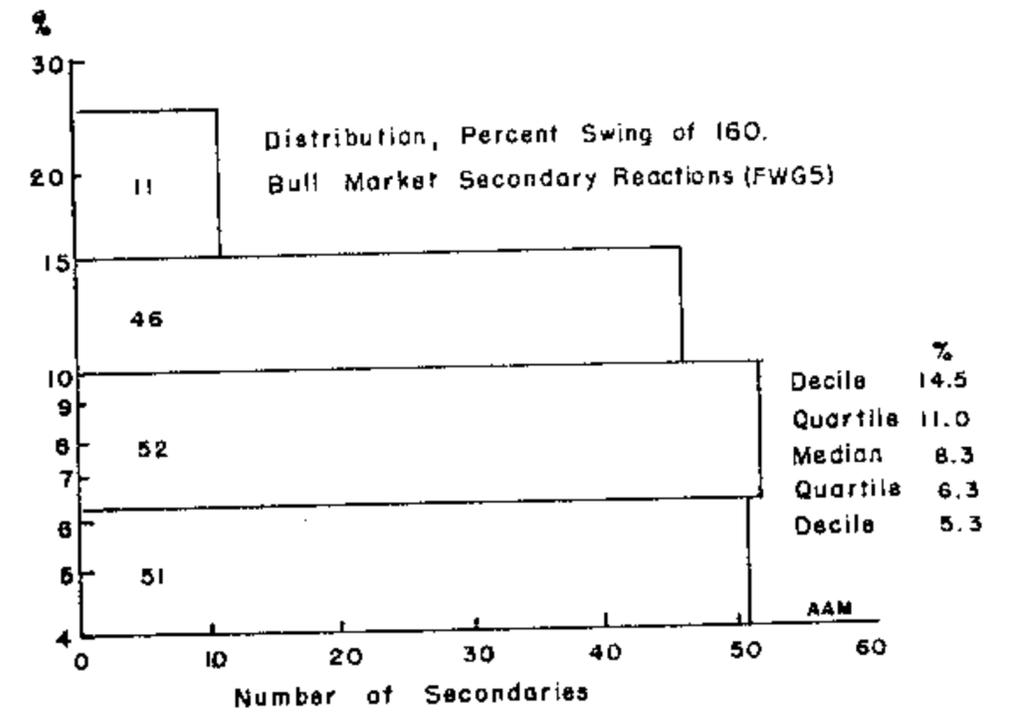
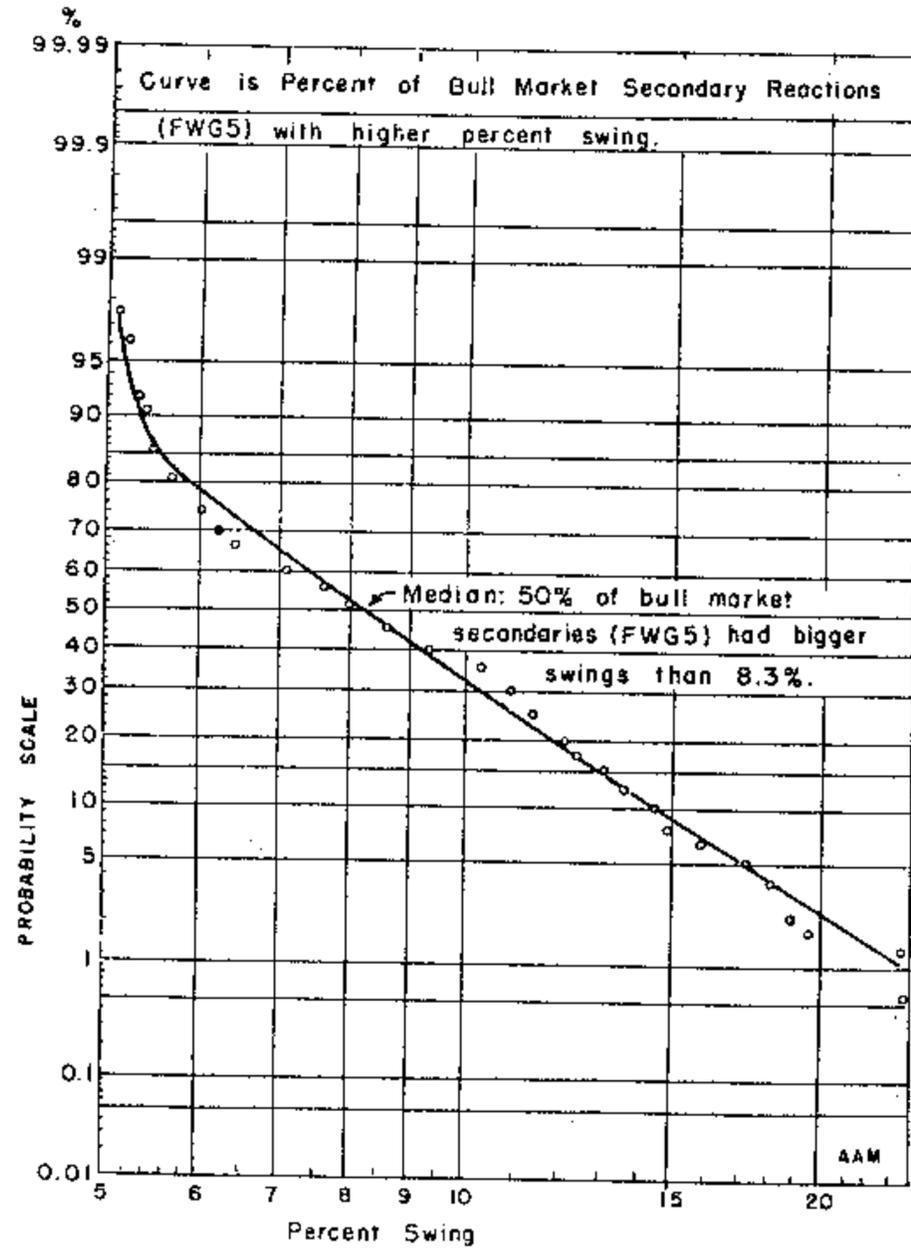
Appendix IV

BULL PRIMARY - DURATION
FWG 10



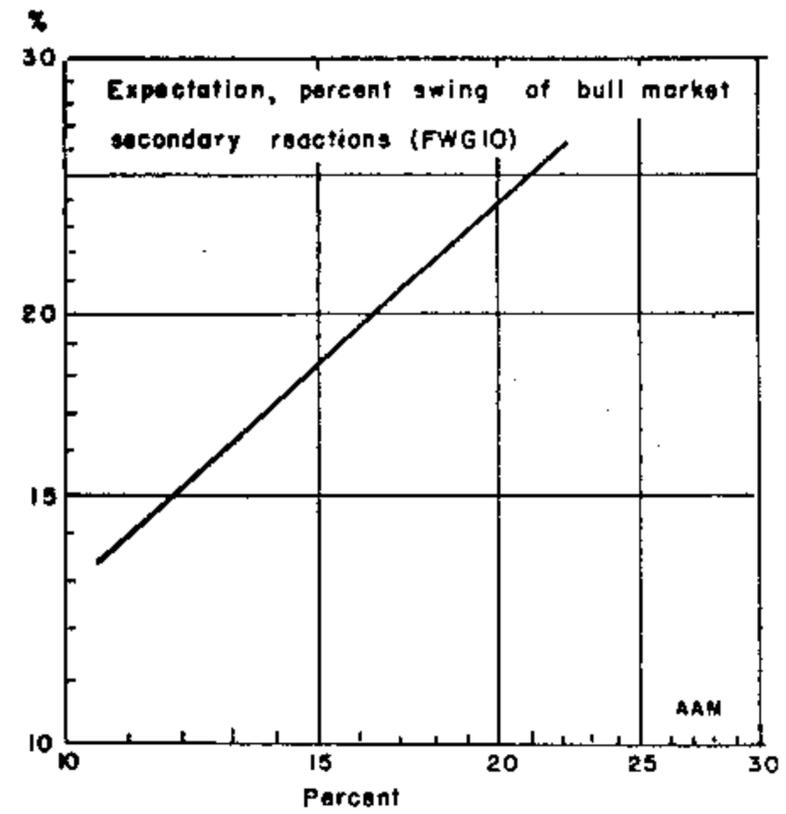
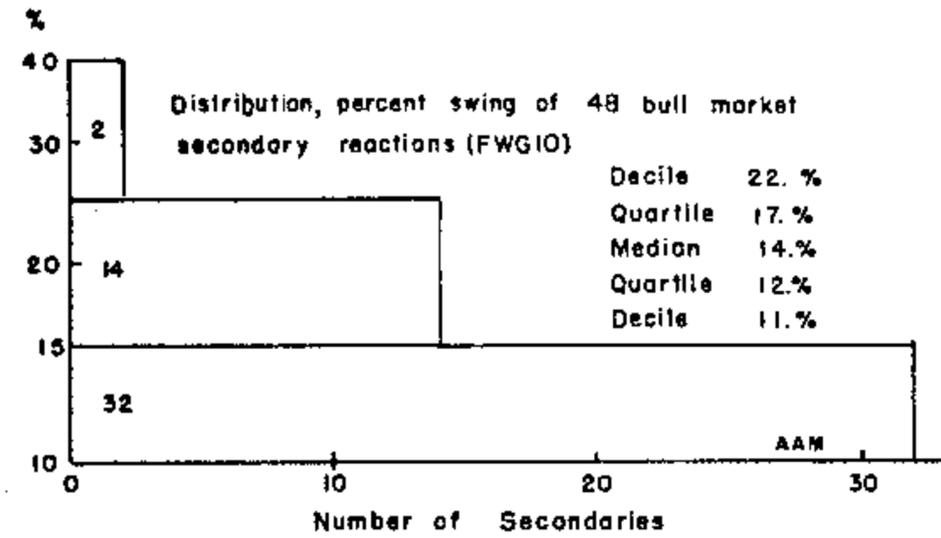
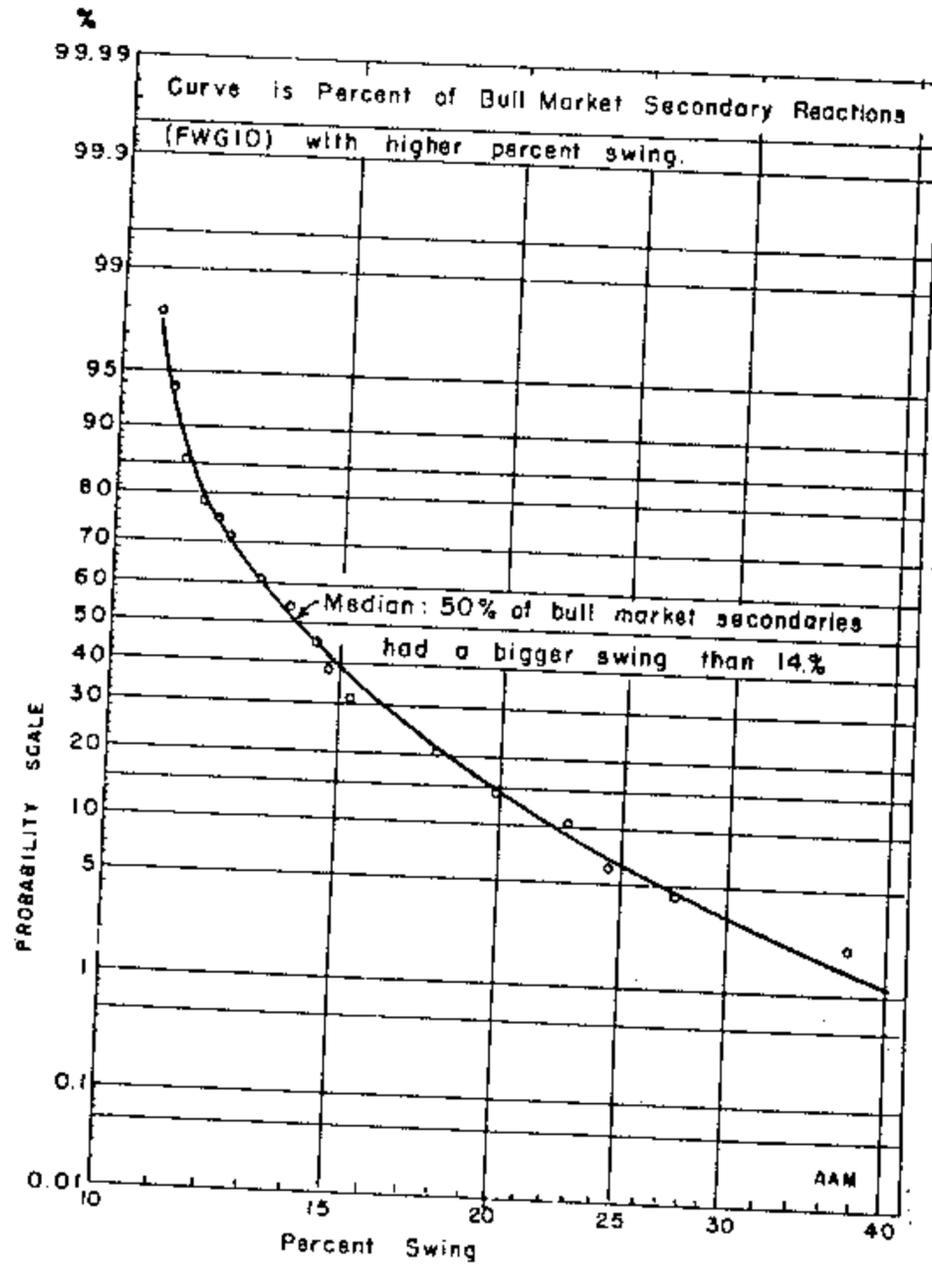
Appendix IV

BULL SECONDARY - PERCENT SWING
FWG 5



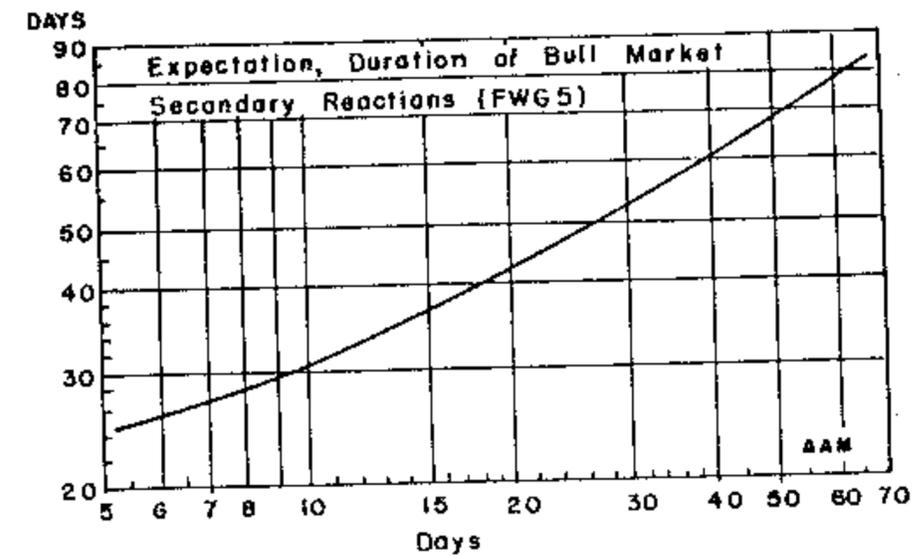
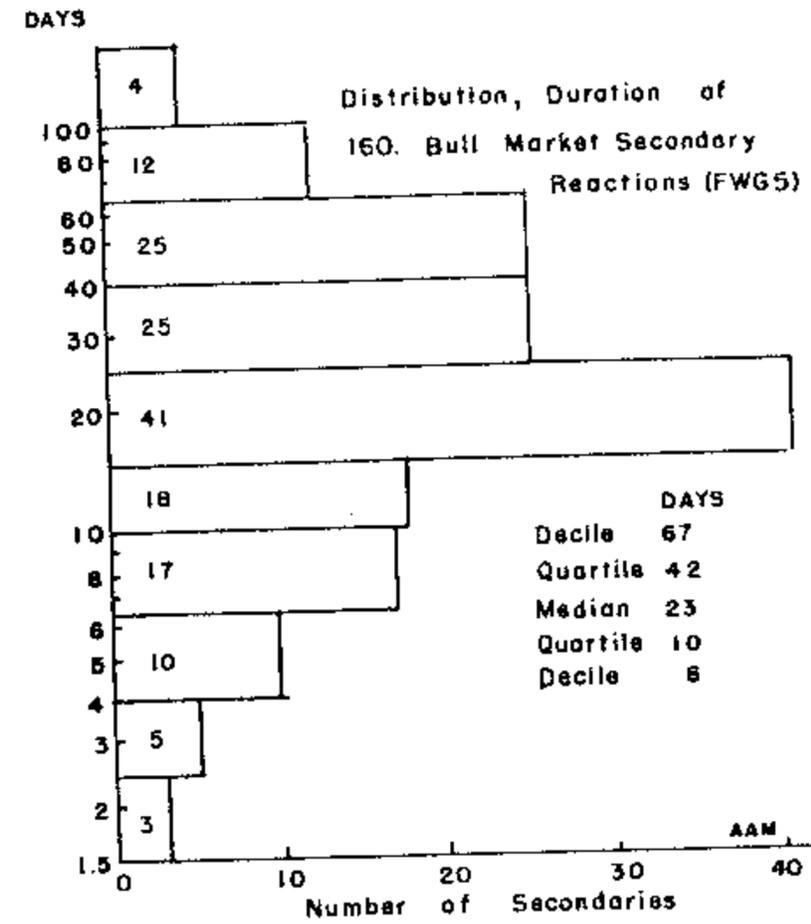
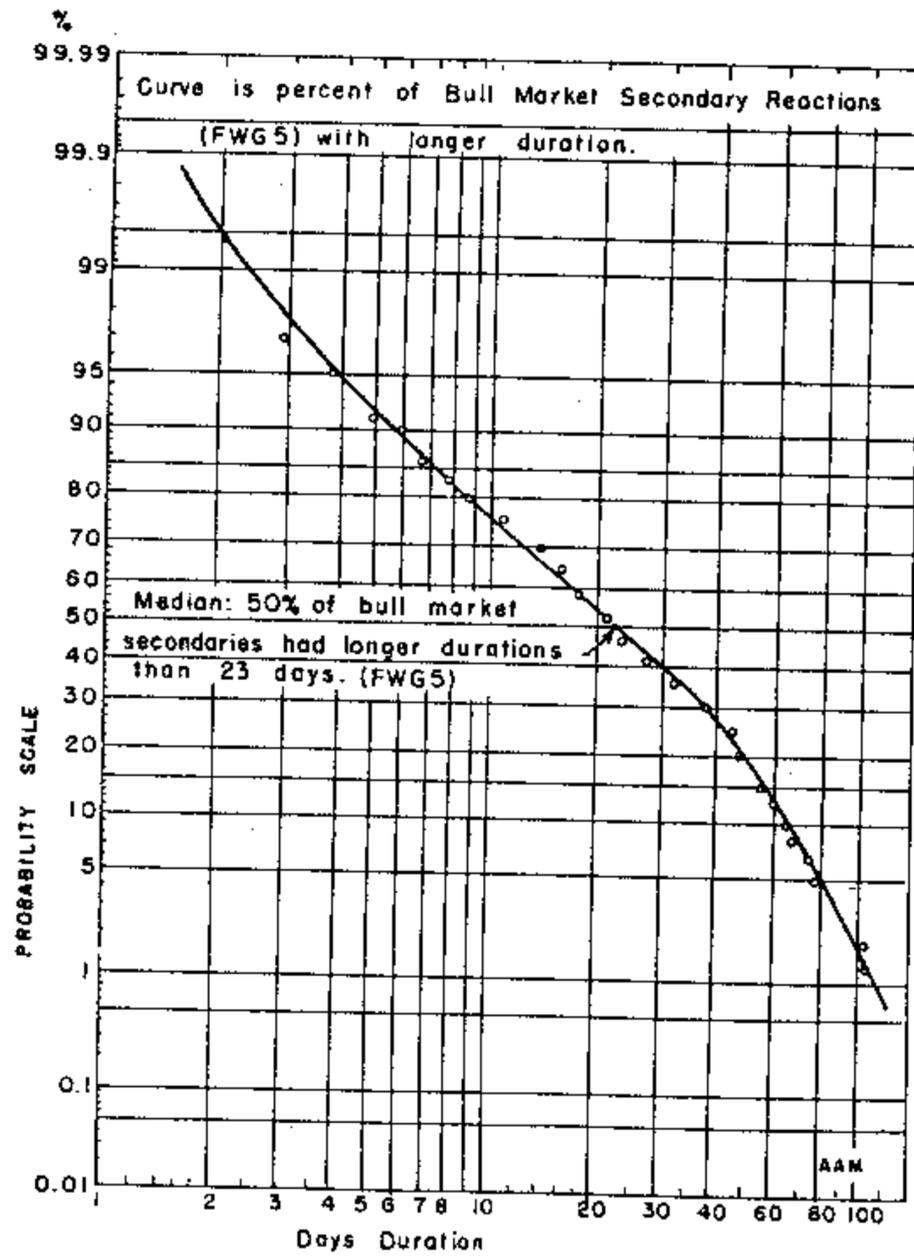
Appendix IV

BULL SECONDARY - PERCENT SWING
FWG 10



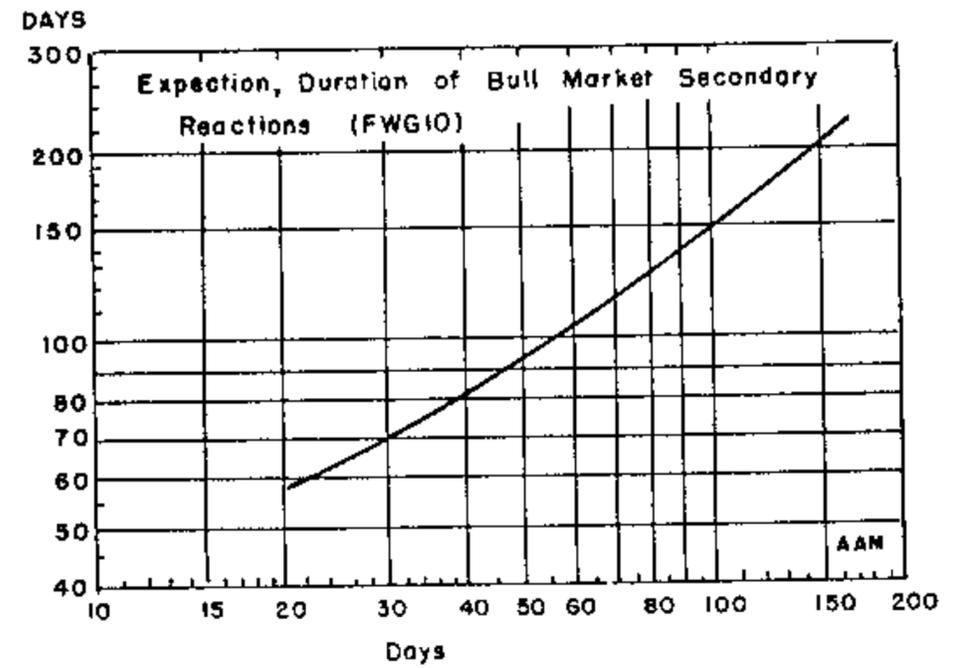
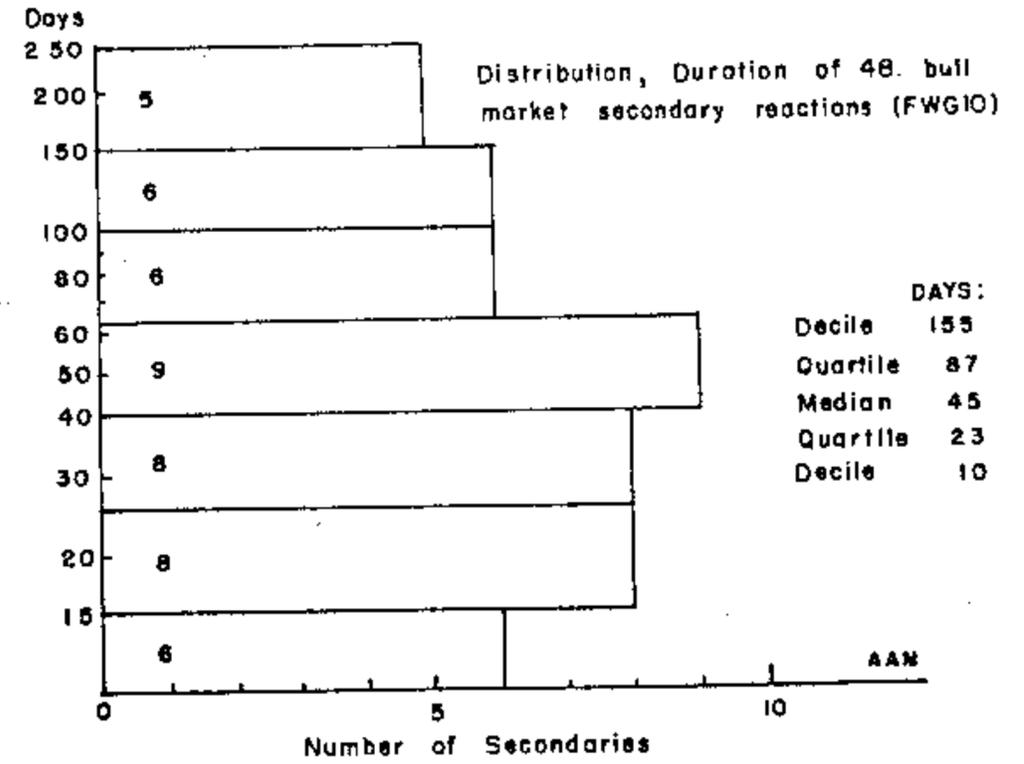
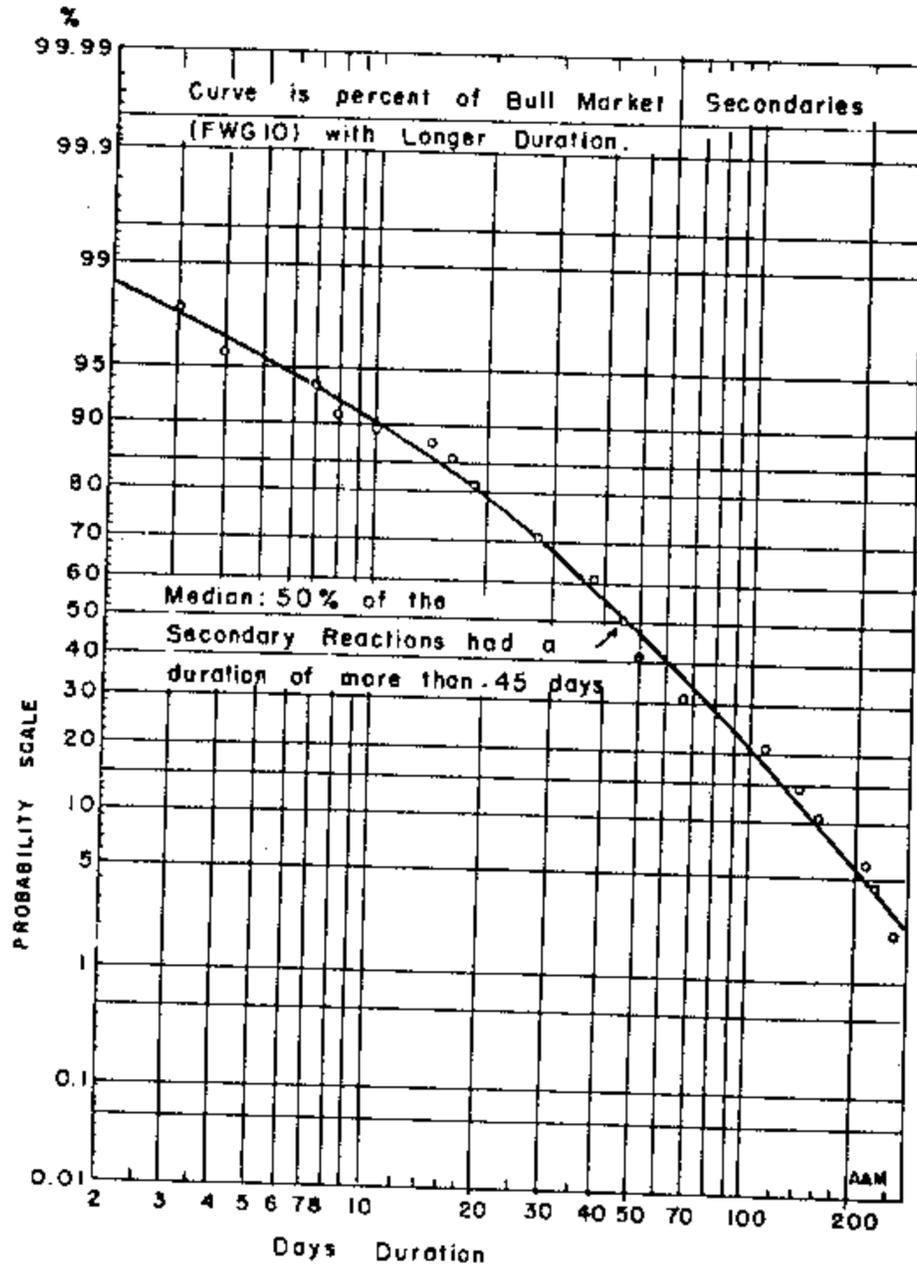
Appendix IV

BULL SECONDARY - DURATION
FWG 5



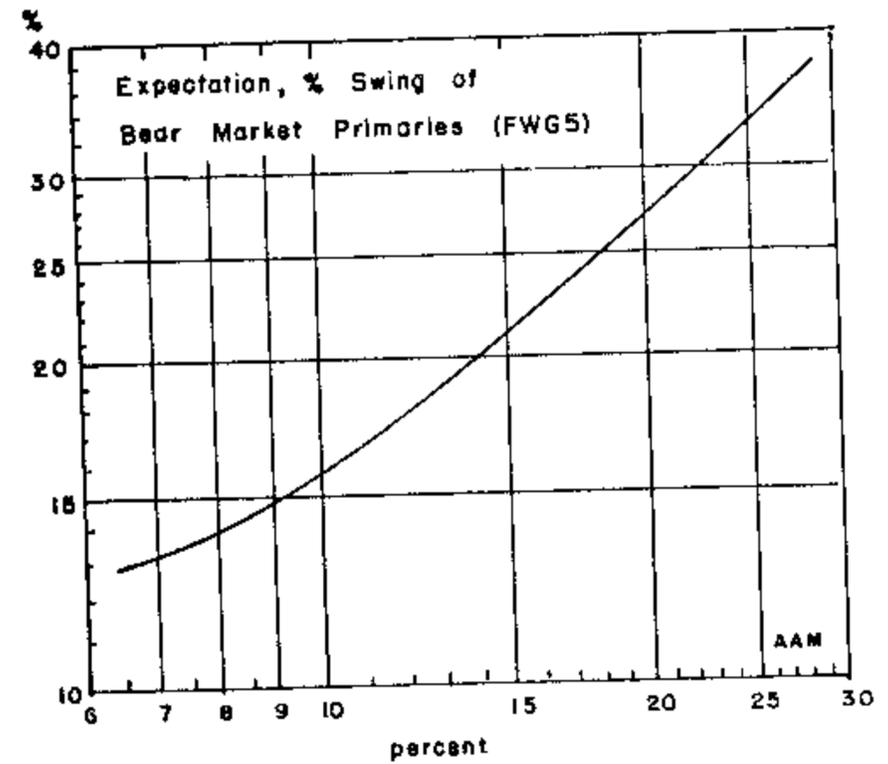
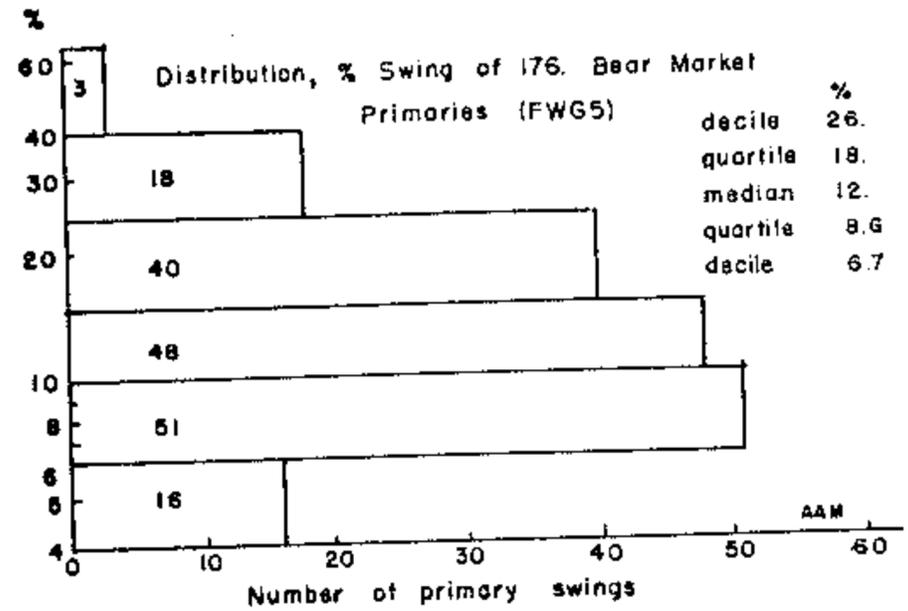
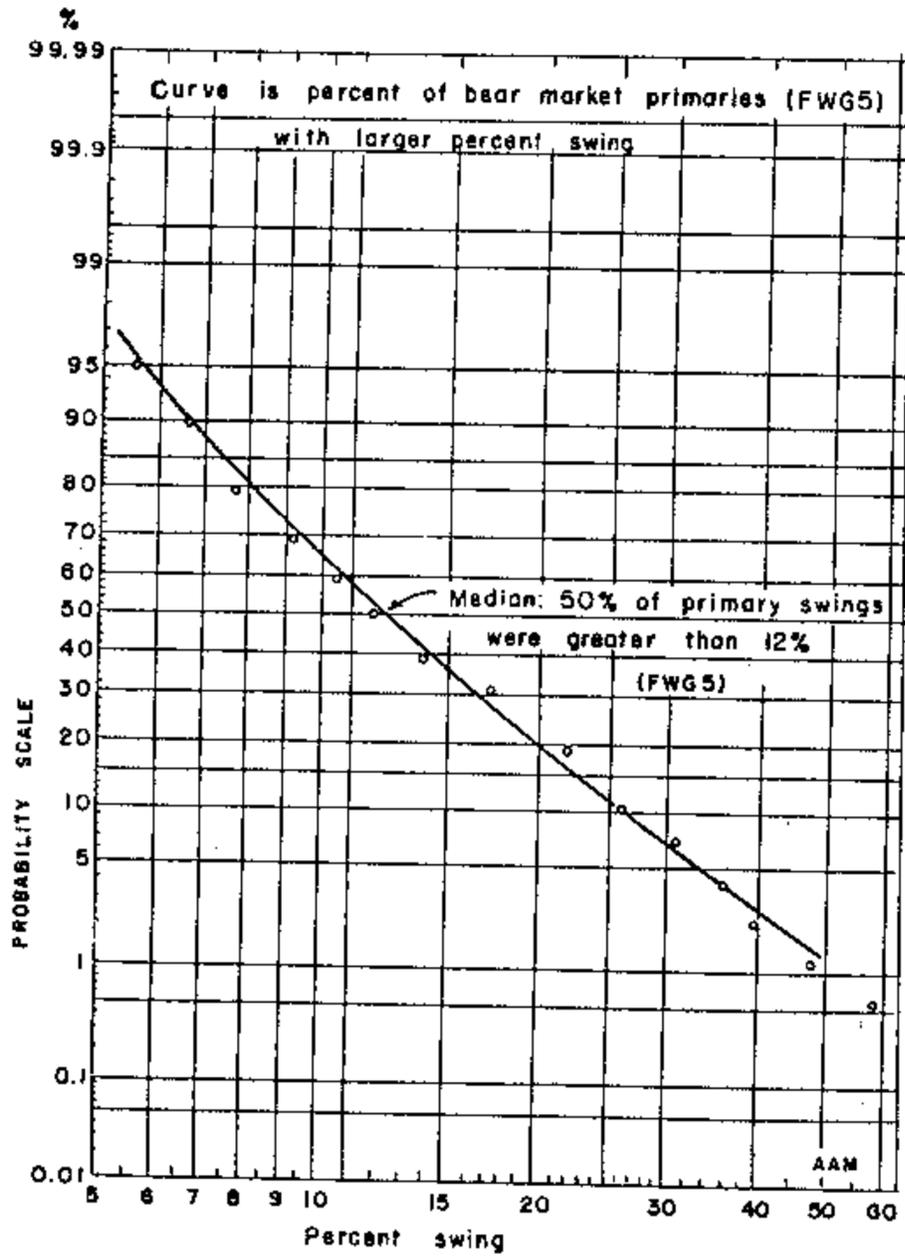
Appendix IV

BULL SECONDARY - DURATION
FWG 10



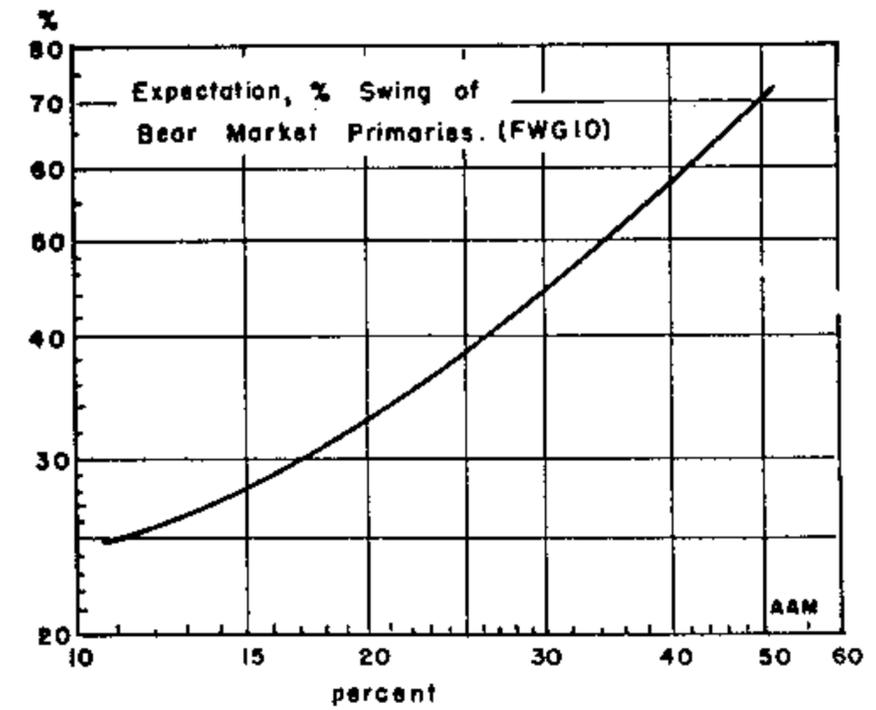
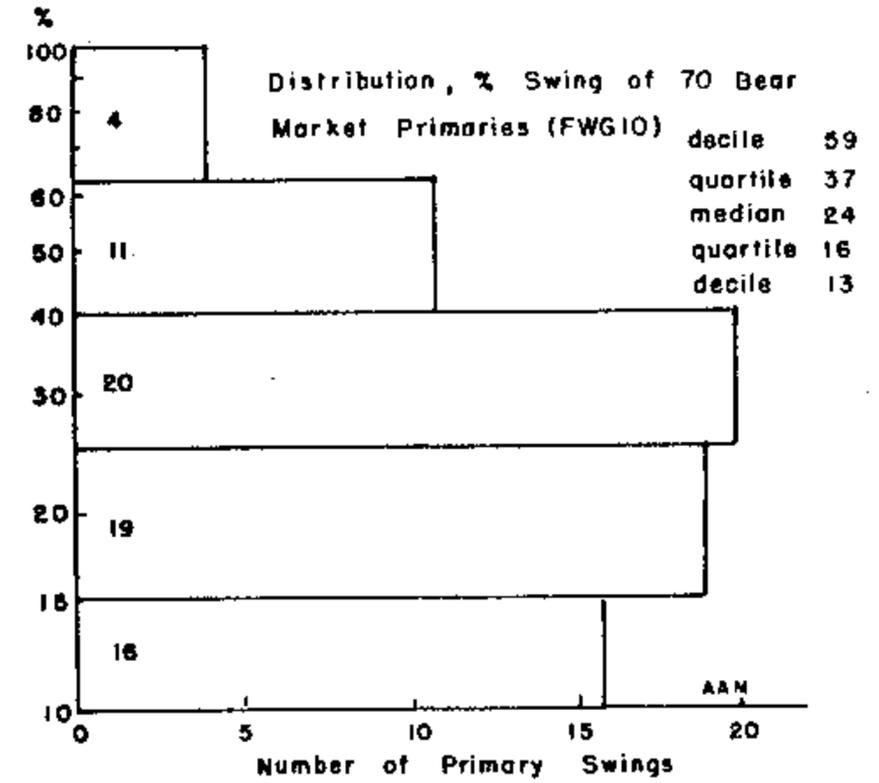
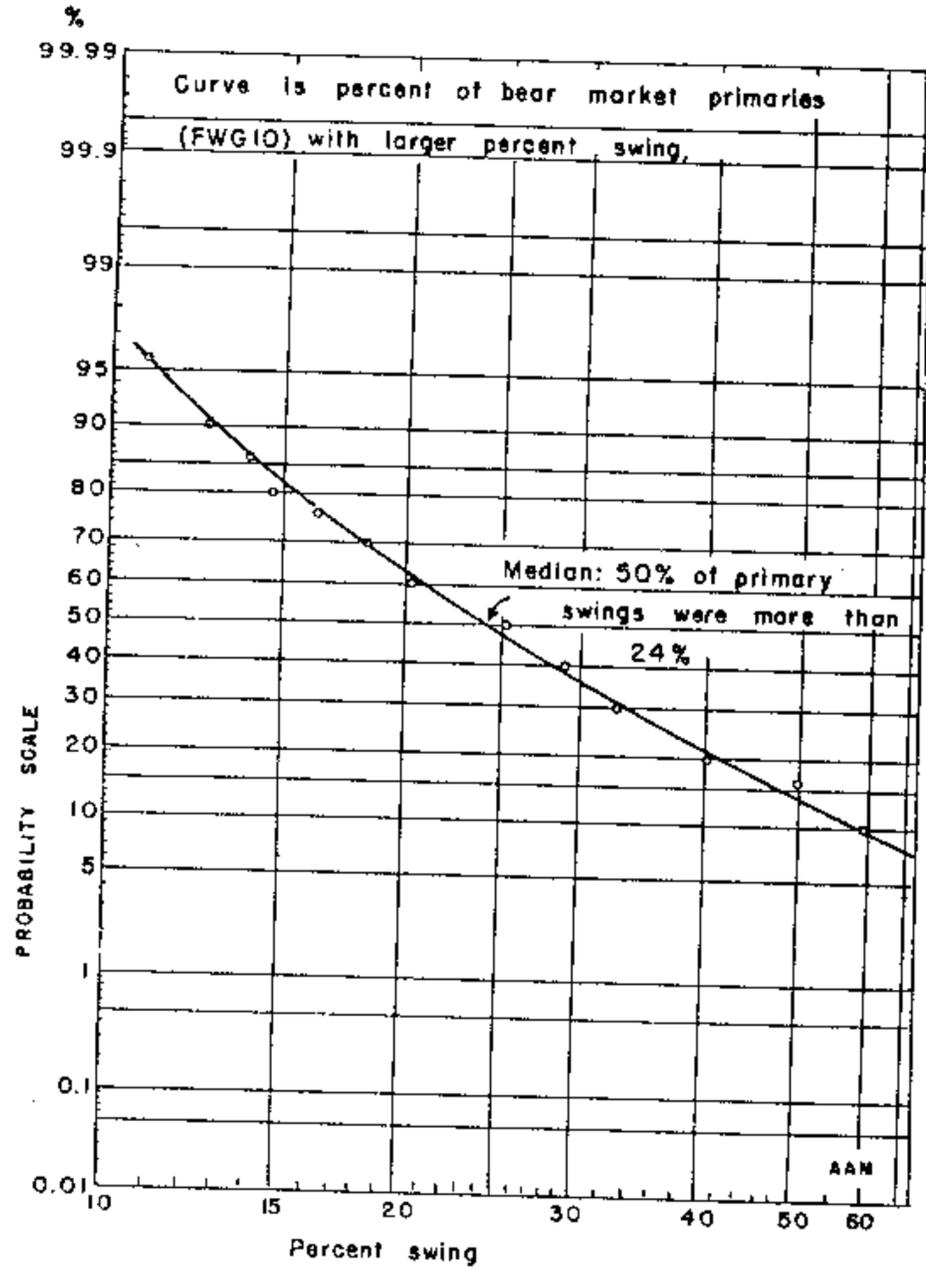
Appendix IV

BEAR PRIMARY - PERCENT SWING
FWG 5



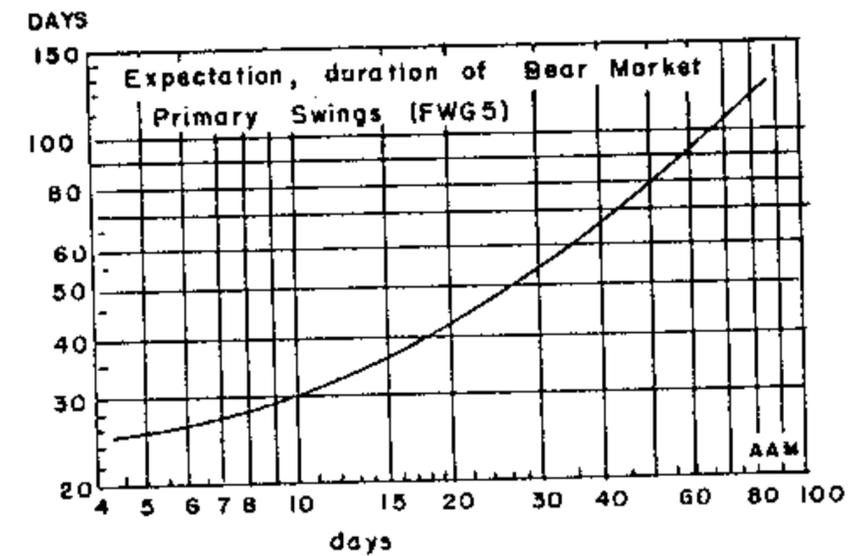
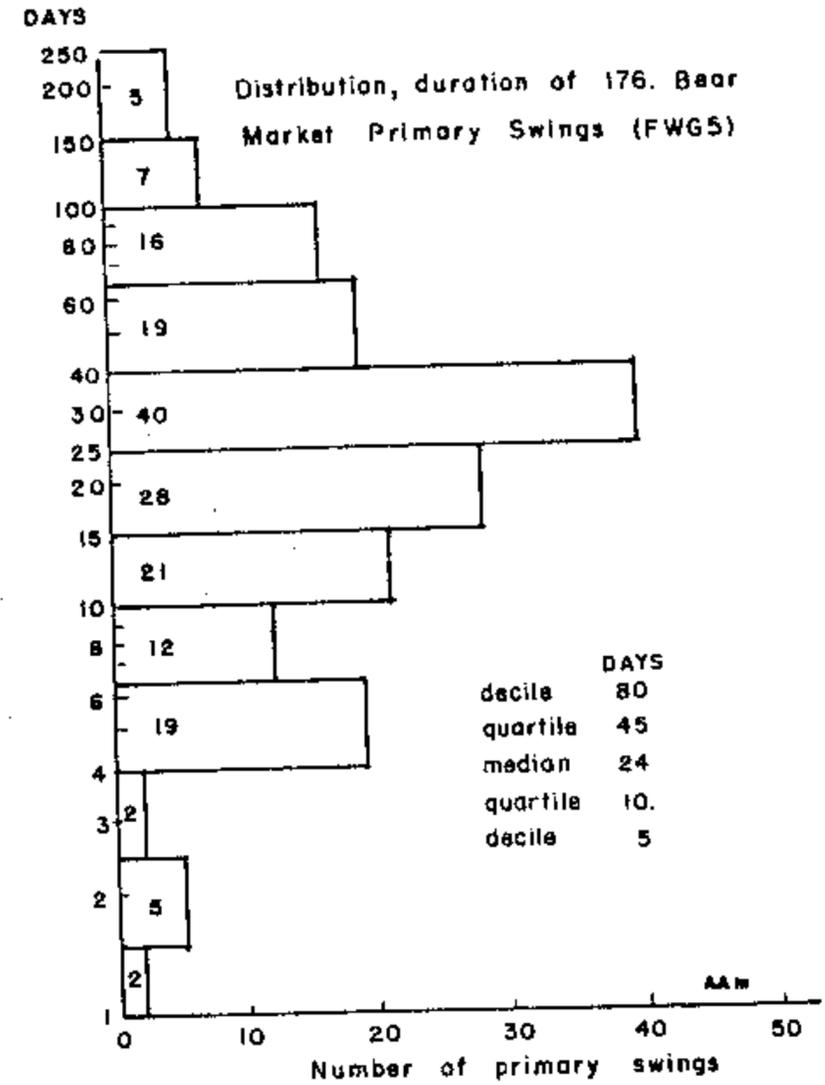
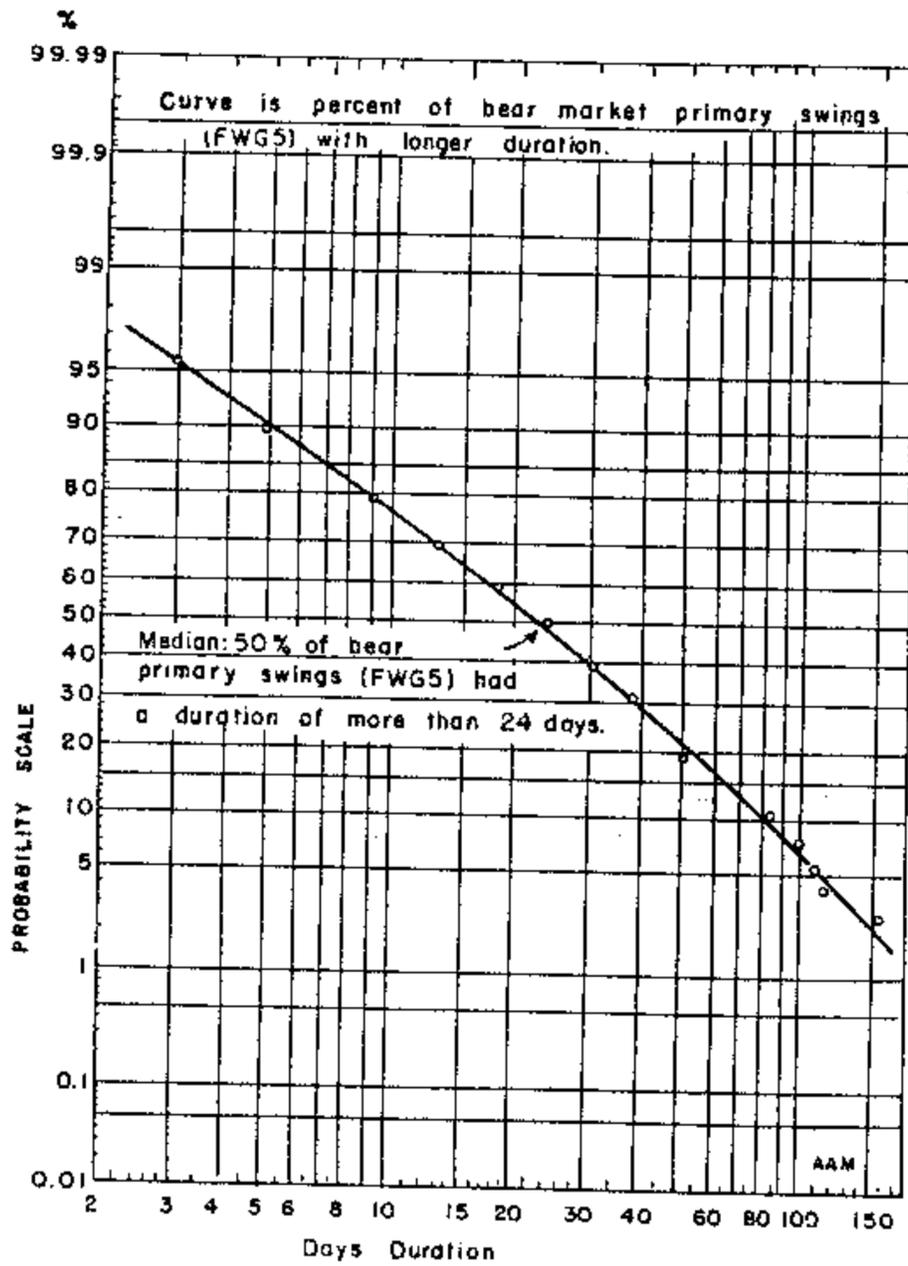
Appendix IV

BEAR PRIMARY - PERCENT SWING
FWG 10



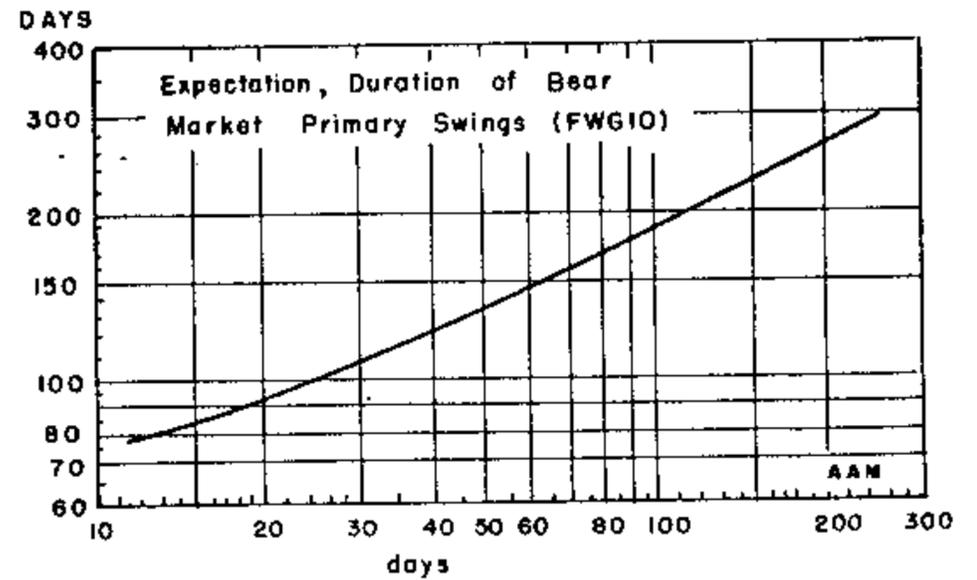
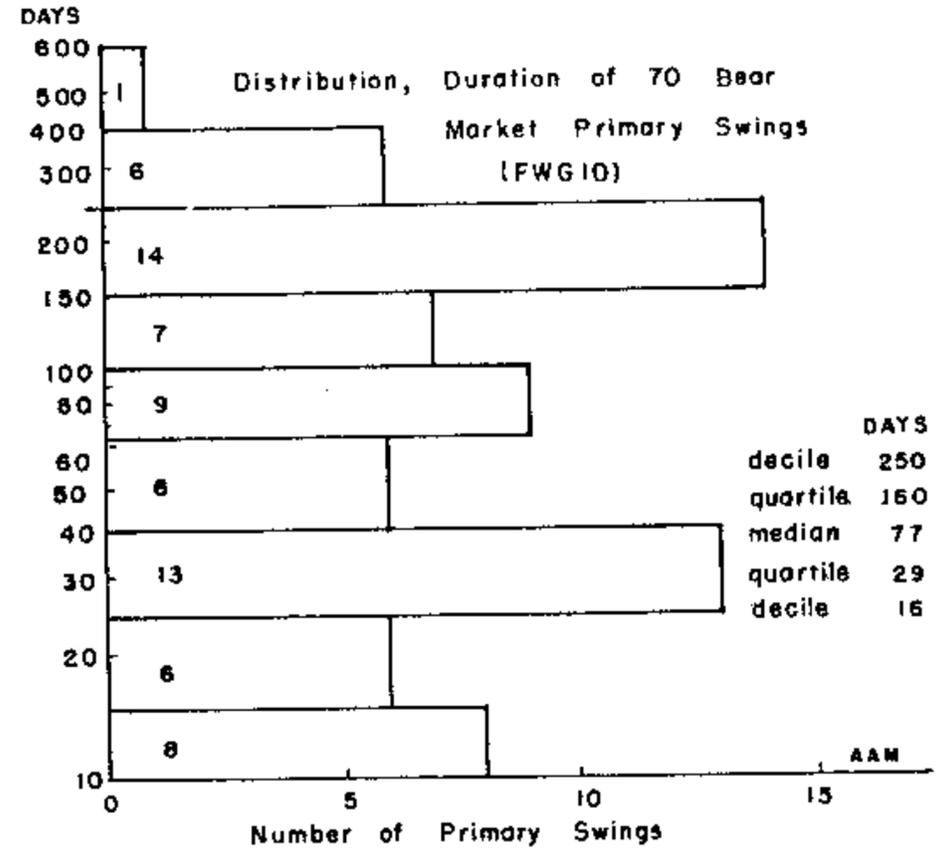
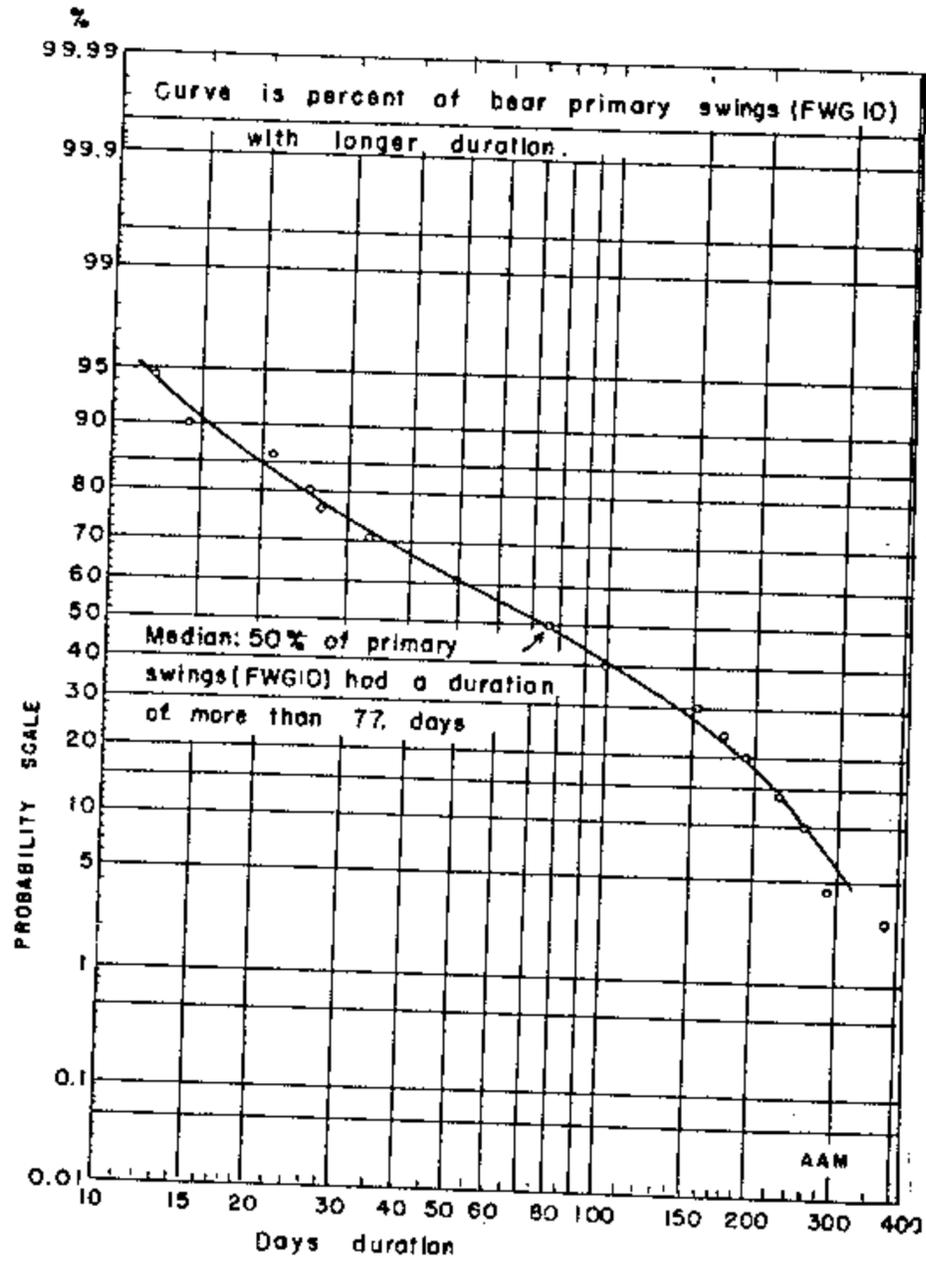
Appendix IV

BEAR PRIMARY - DURATION
FWG 5



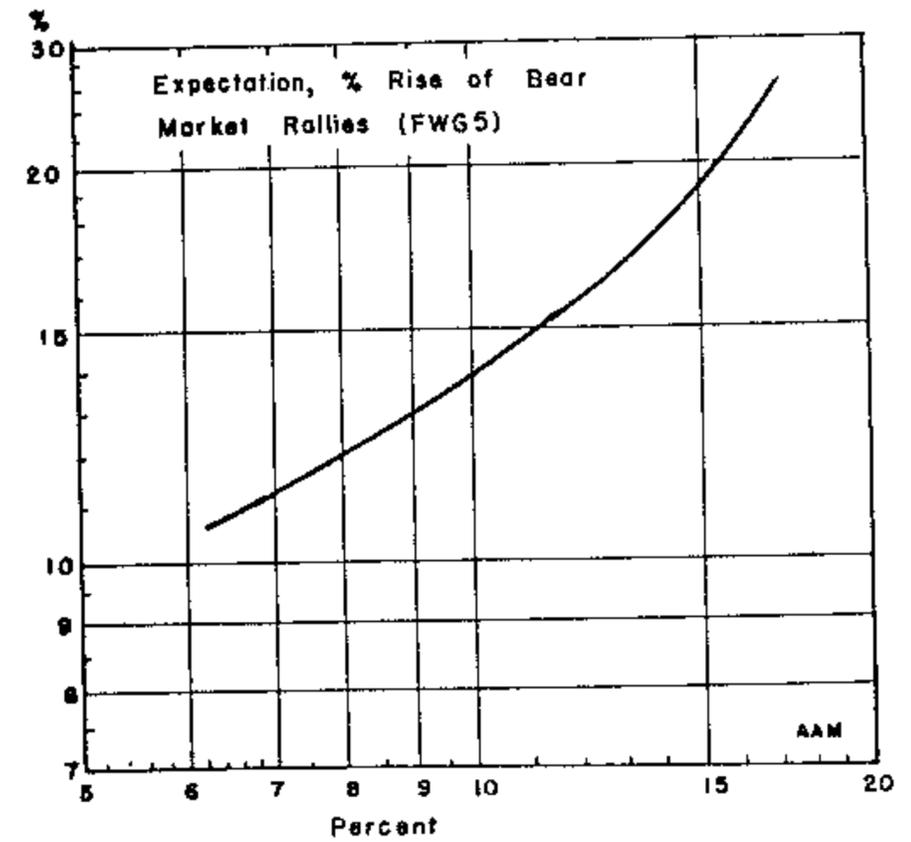
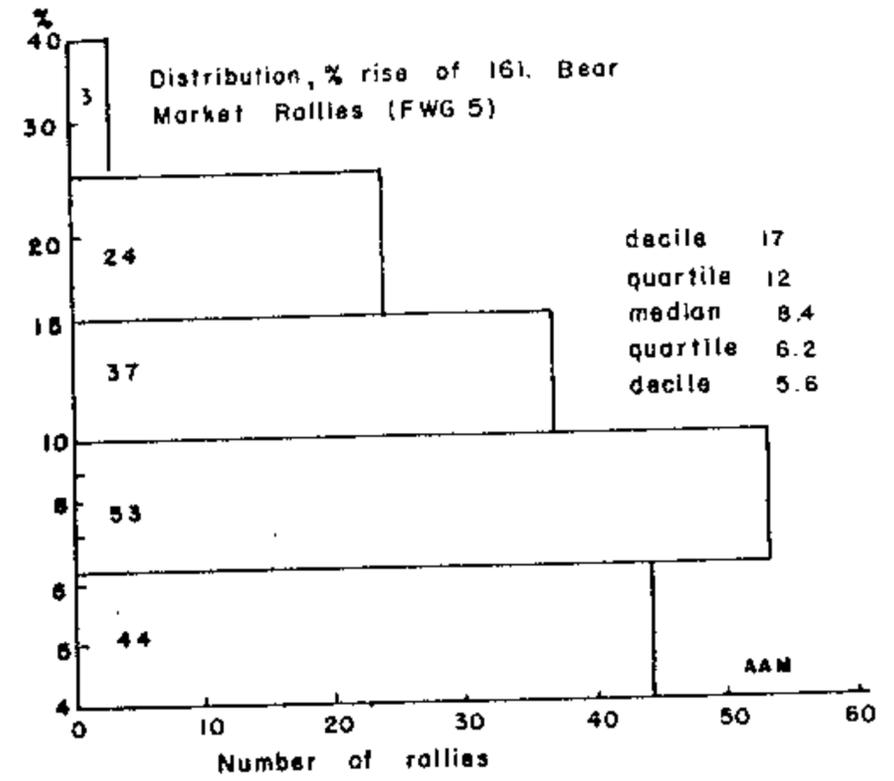
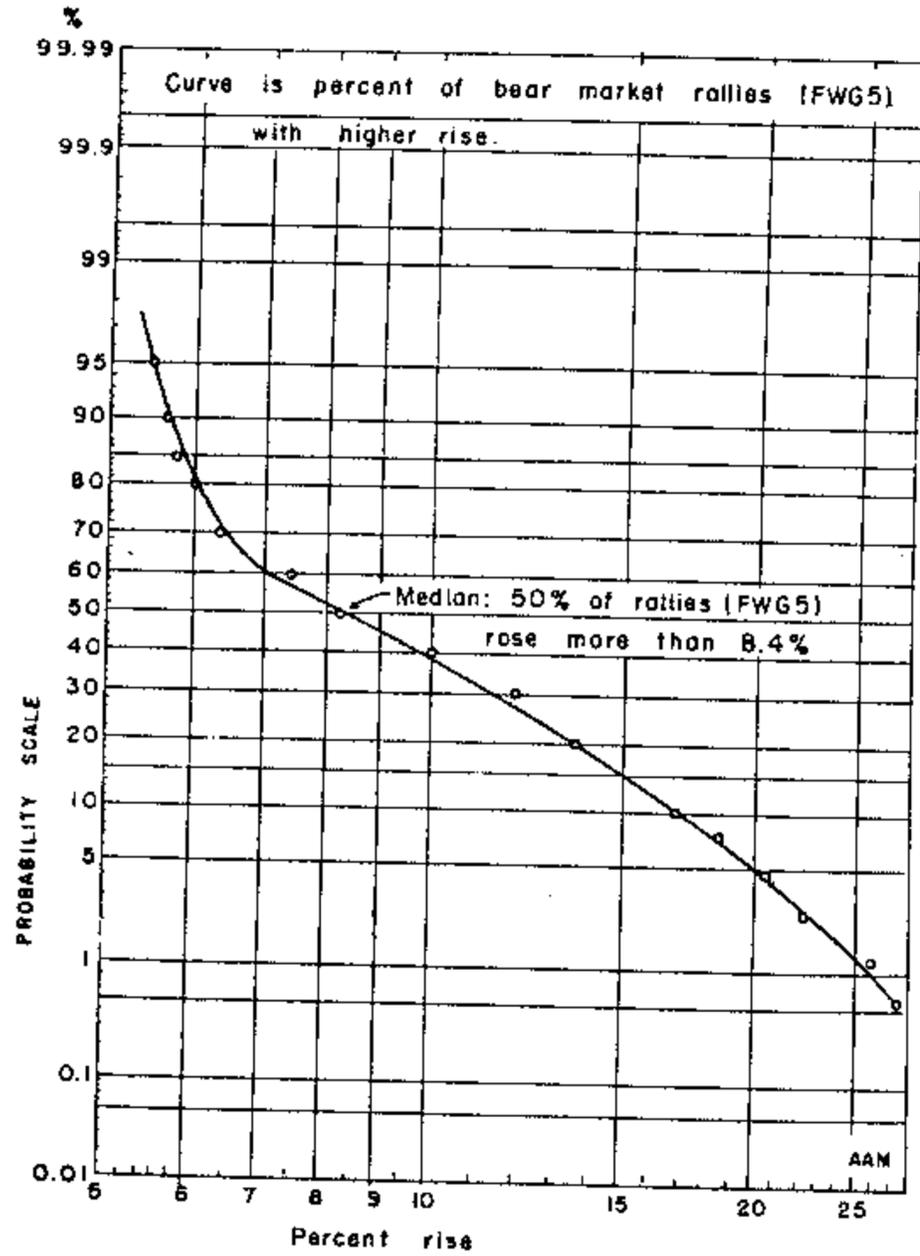
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BEAR PRIMARY - DURATION
FWG 10



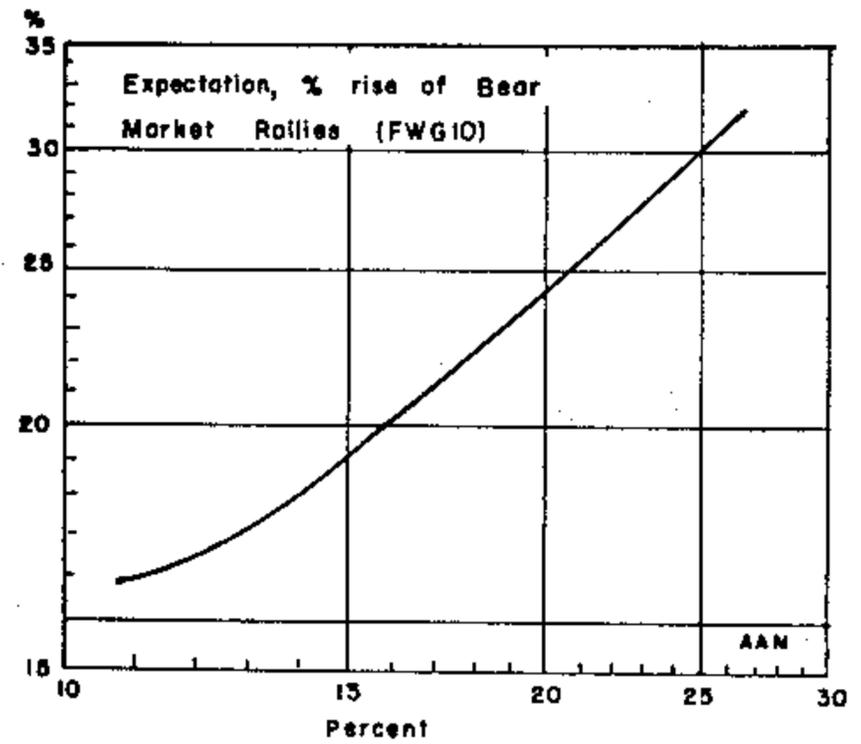
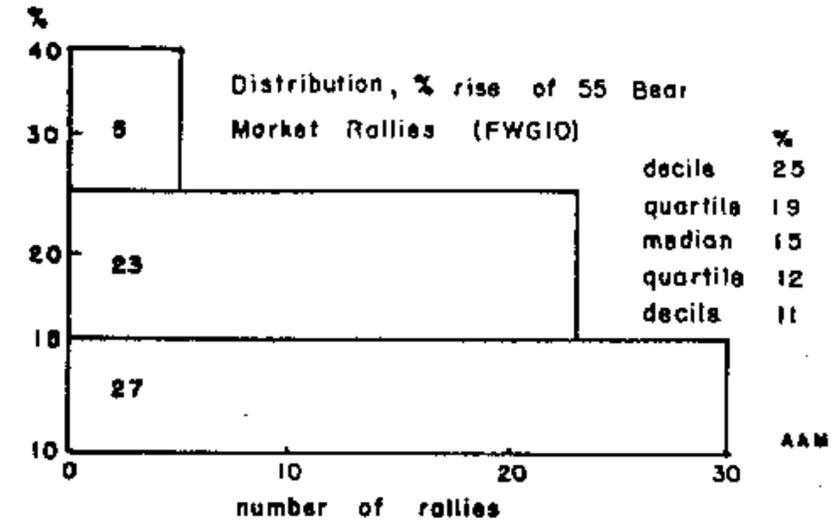
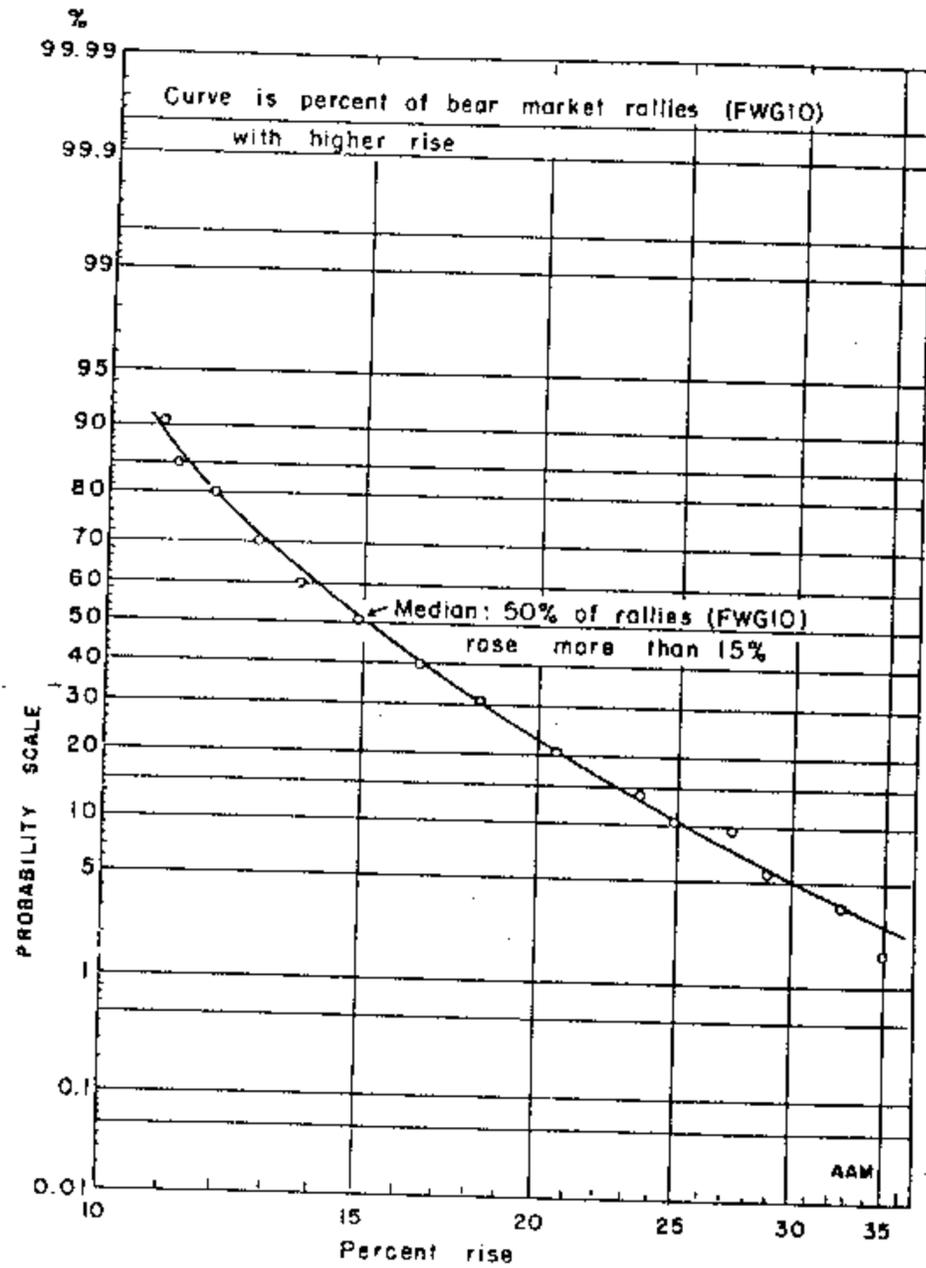
Appendix IV

BEAR RALLY - PERCENT SWING
FWG 5



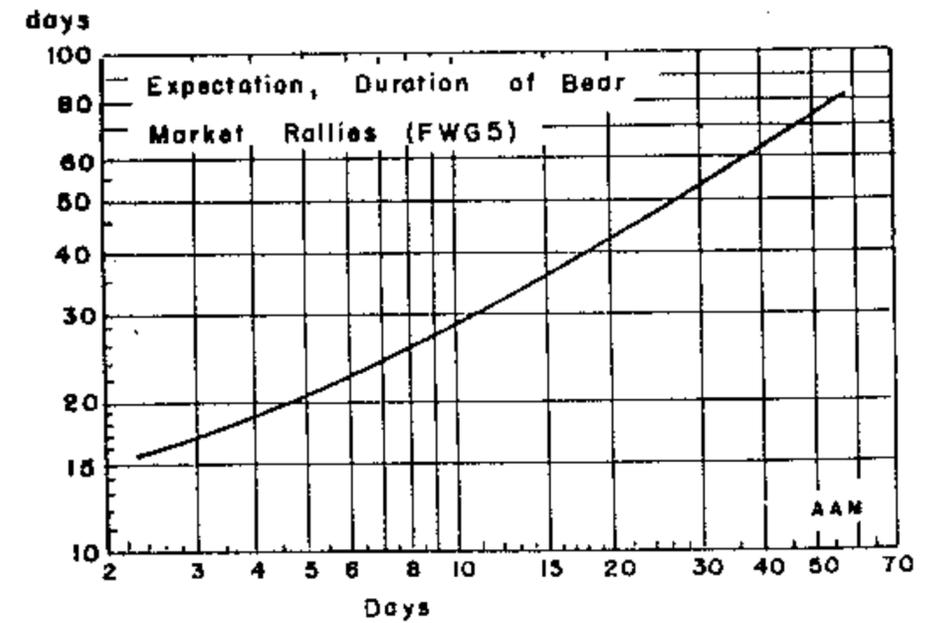
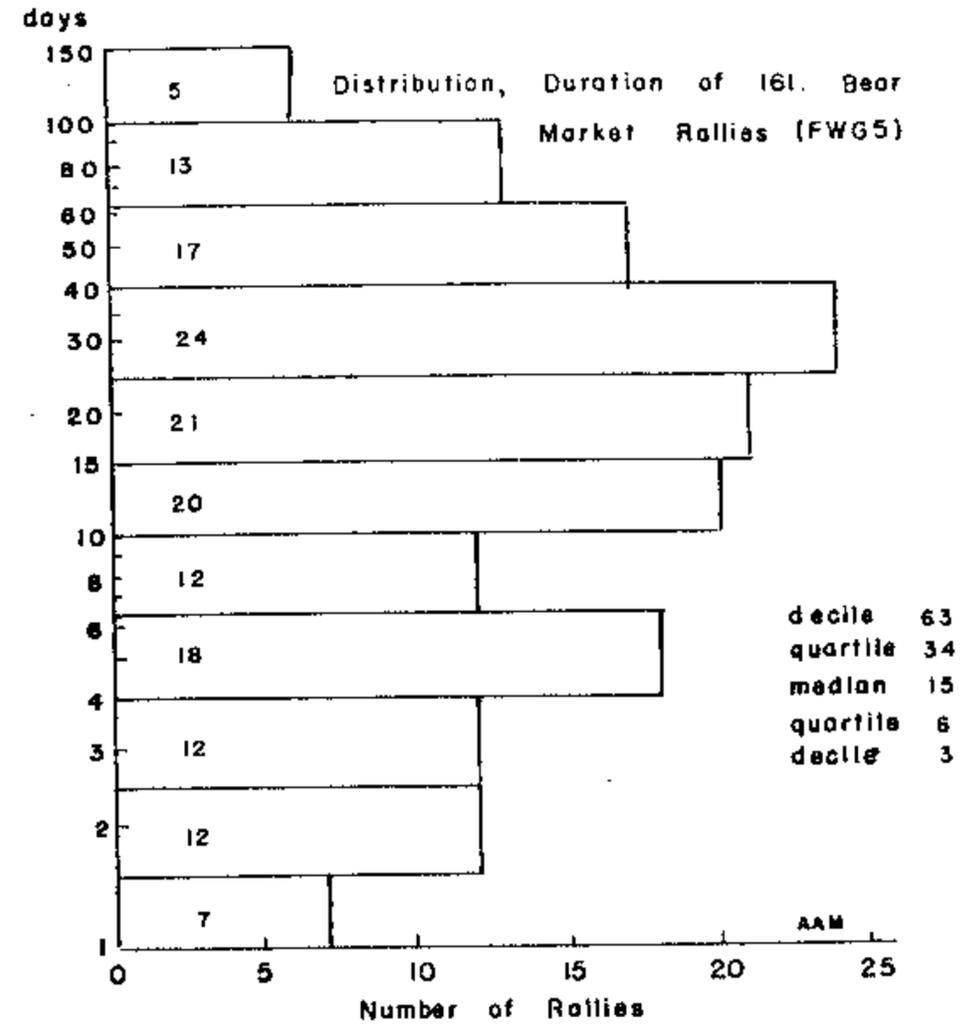
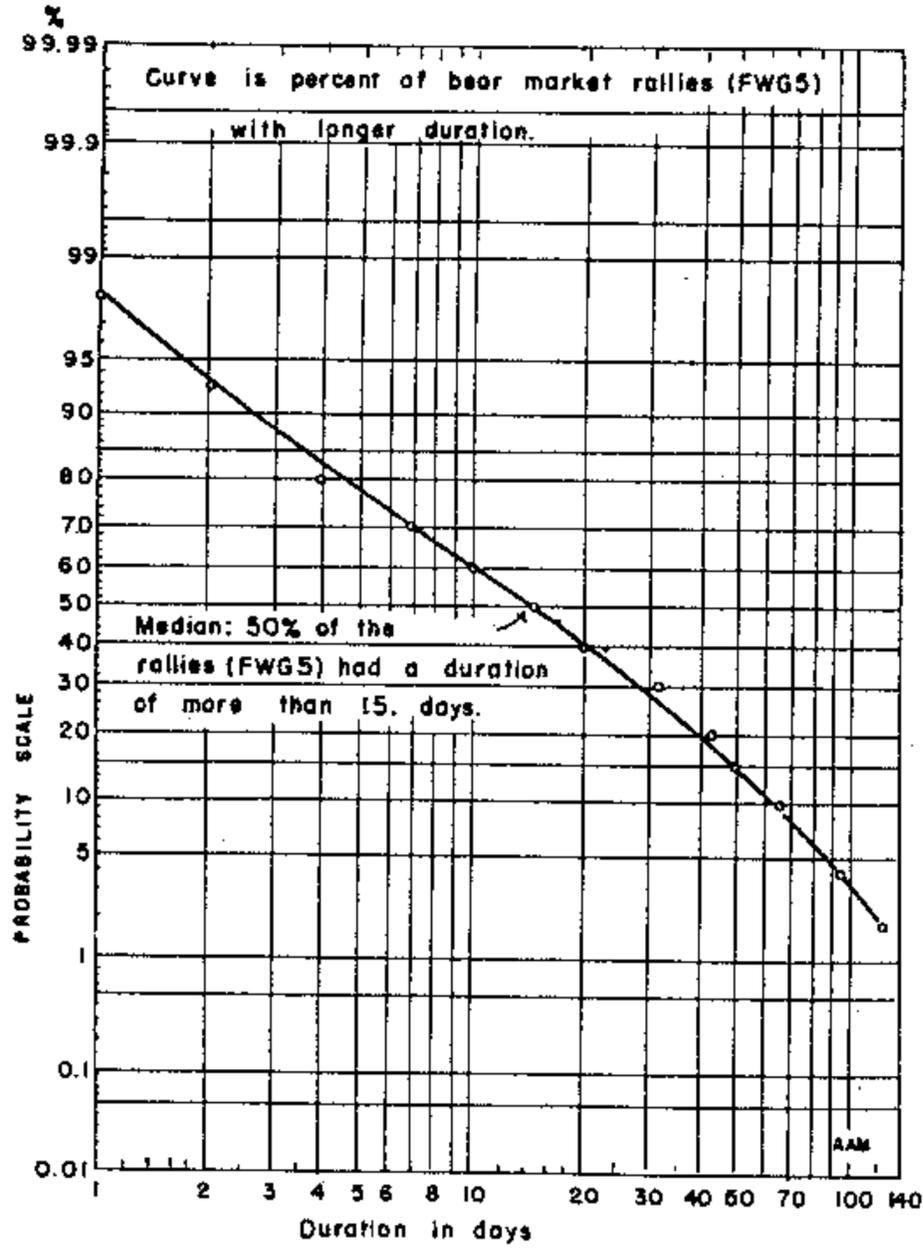
Appendix IV

BEAR RALLY - PERCENT SWING
FWG 10



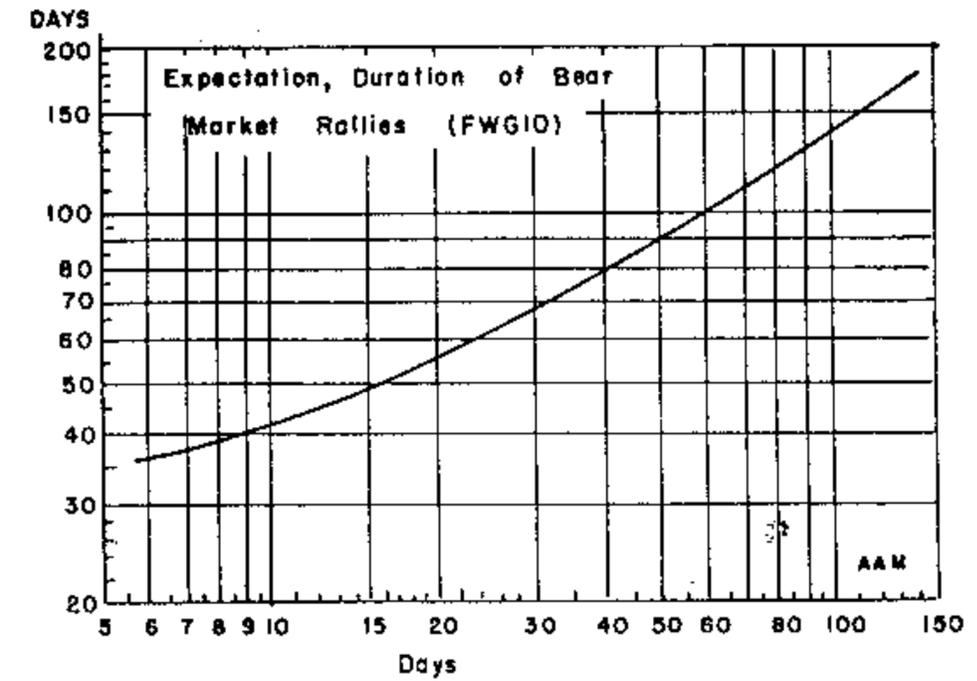
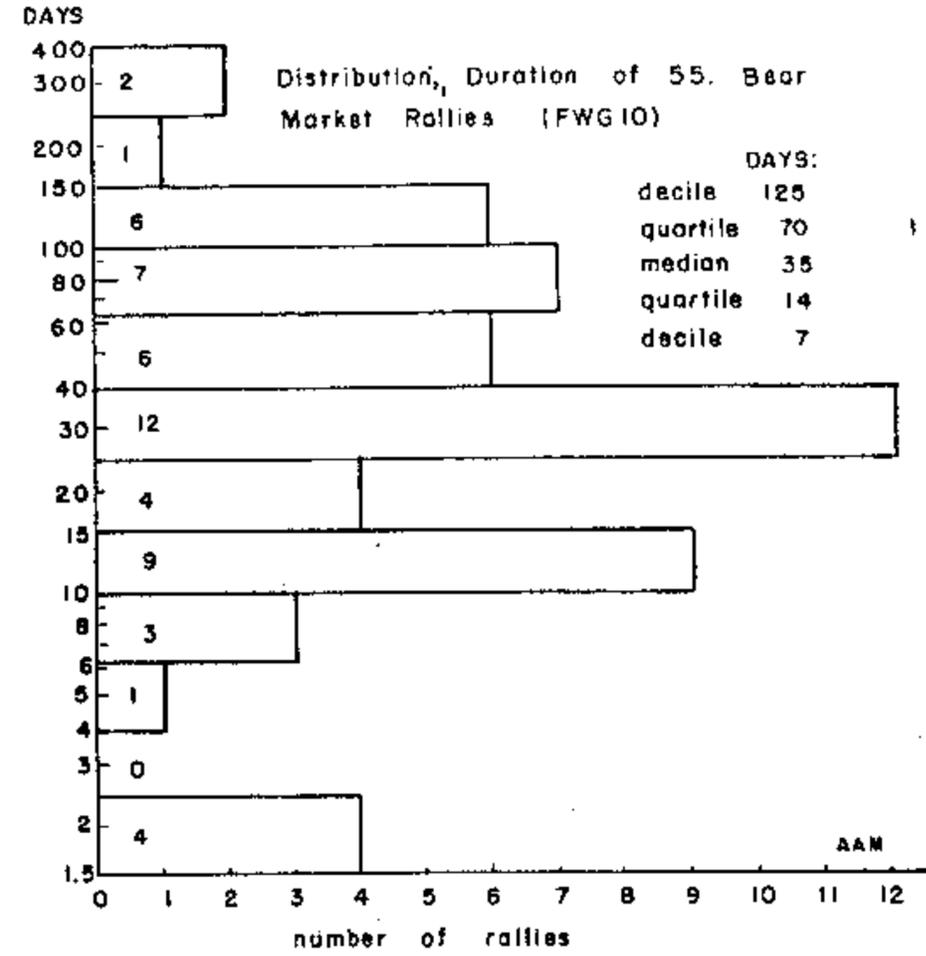
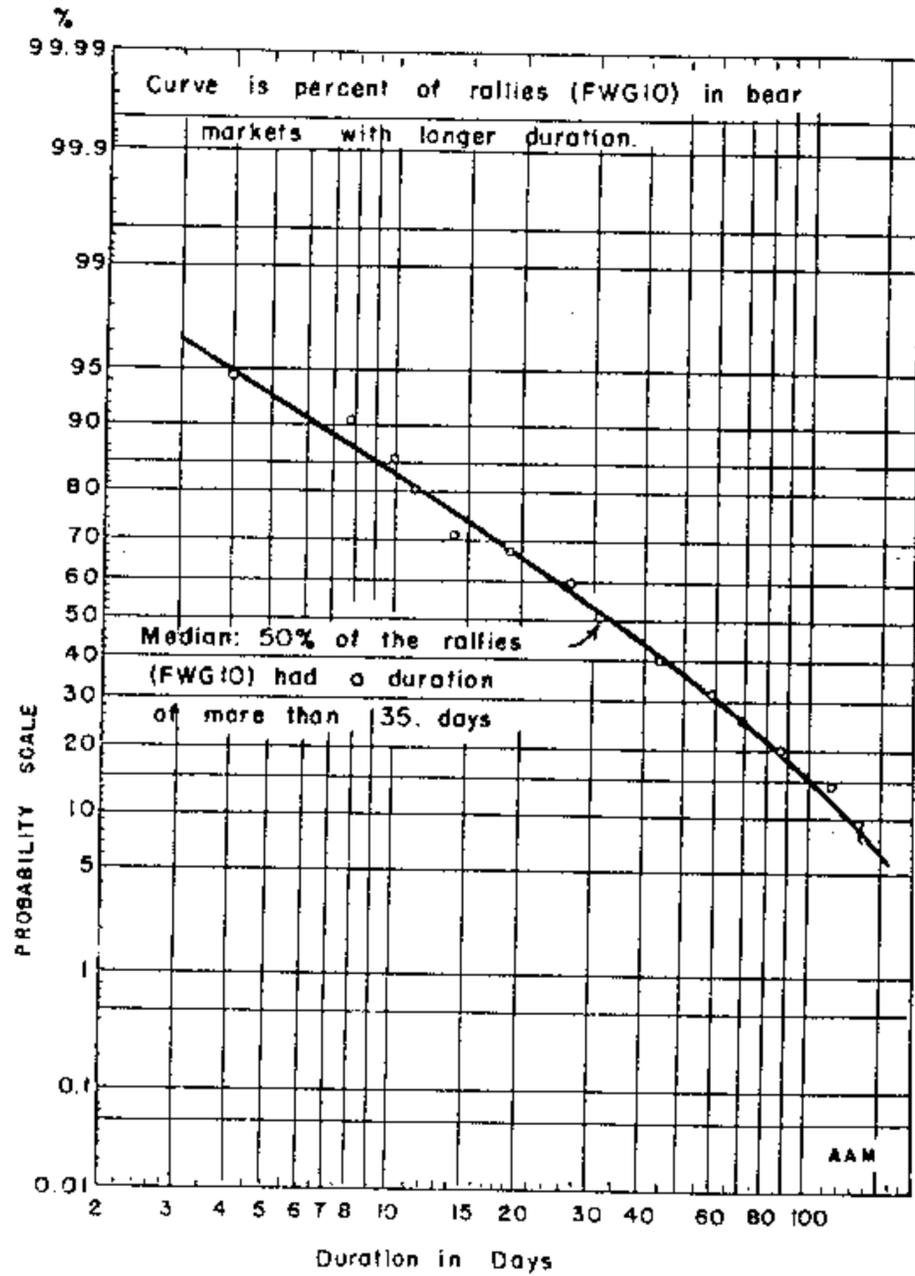
Appendix IV

BEAR RALLY - DURATION
FWG 5



Appendix IV

BEAR RALLY - DURATION
FWG 10



Appendix V

WHAT IS THE DOW THEORY?

The Dow Theory began with Charles Dow (1850-1902), founder of the Dow Jones News Service, and founder and first editor of the Wall Street Journal. In his capacity, he wrote many editorials on the subject of the market. These editorials are the foundations of the Dow Theory. His work has endured. Today the interpretation of his ideas is providing a livelihood for many men.

S. A. Nelson, a writer and publisher, tried to persuade Dow to write a book summarizing his ideas, but didn't succeed. Nelson had determination, however, and collected all of the important editorials from the files of the Wall Street Journal. He published these in a small book The ABC of Stock Speculation. In this book he labelled the Dow chapters "Dow's Theory"--and the name was established. Nelson laid the cornerstone.

A few years after Dow's death, William Peter Hamilton became editor of the Wall Street Journal. He proceeded to develop Dow's ideas from the status of general statements into a workable method. In 1922 he wrote a book, The Stock Market Barometer, which erected a structure on Dow's foundation. A short time before his death he supported his thesis by a famous editorial "The Turn of the Tide." This editorial, in the October 23, 1929 Wall Street Journal (one week before Black Tuesday), definitely called the end of the long bull market and the beginning of the great bear market.

Robert Rhea (1887-1939), because of an airplane accident in the first world war, was bedridden from 1918 to his death. In Colorado Springs, he began a study of the Dow ideas--first as a hobby, and later as a profitable vocation. His own wealth accelerated from the practice of his ideas. He was long of stocks through most of the twenties; he had no stocks at the time of the 1929 crash; he thereafter sold short for two years. Perhaps I am prejudiced, but I believe that he contribu-

ted more to the development of the Dow Theory than Dow or Hamilton. You will understand my prejudice when you learn that Rhea liked to count and to measure. (This is the underlying thesis of the book you are reading.) Rhea's writings are a goldmine of statistics for the serious student.

Some very capable students of the Dow Theory are active today. One of the best is Richard Russell of San Diego. Russell has written a book The Dow Theory Today. He supplements his analyses of the market with other market barometers.

Another capable interpreter is E. George Schaefer, author of How I Helped More Than 10,000 Investors to Profit in Stocks. In this book, he develops his ideas of a "New Dow Theory."

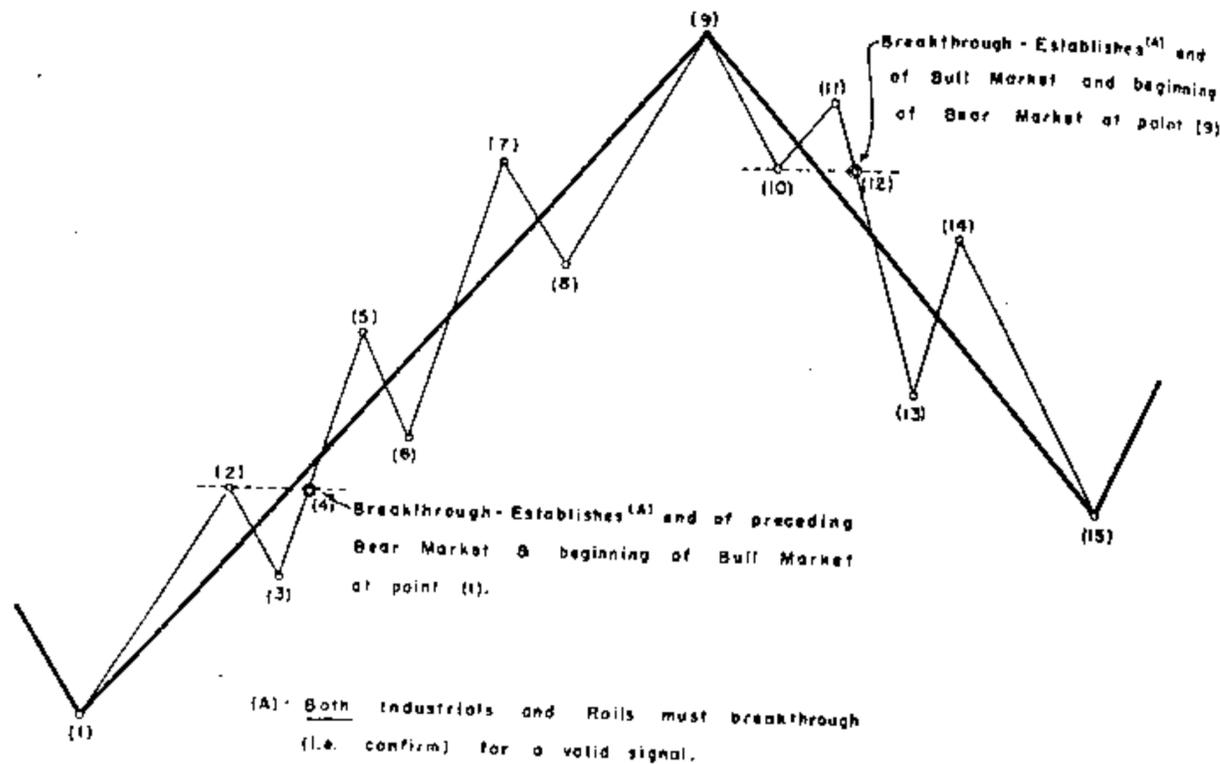
Another acute interpreter is Perry Greiner, who was associated with Robert Rhea in the last years of Rhea's work.

Many books have been written on the Theory (See Appendix X), but the fundamentals are not complicated. Hamilton wrote "The essence of Dow's Theory can be summed up in three sentences. In an editorial December 19, 1900, he says 'The market is always to be considered as having three movements, all going on at the same time. The first is the narrow movement from day to day. The second is the short swing, running from two weeks to a month or more; the third is the main movement, covering at least four years in its duration.'"

Hamilton's quotation was an oversimplification, of course. Actually, it is an example of the beginnings of the "Theory." The work of Hamilton and Rhea, and others, has expanded the beginnings into a fair-sized book shelf.

The outline which follows is a condensation of these writings.

DOW THEORY - BASIC



PRIMARY MARKETS: (1)-(9) -- Bull Market
 (9)-(15) -- Bear Market
 These Primary Markets last from one year to several years.

PRIMARY SWINGS: (1)-(2), (3)-(5), (6)-(7), (8)-(9), (9)-(10), (11)-(13), (14)-(15).
 (Also called "legs".)

SECONDARY REACTIONS: (2)-(3), (5)-(6), (7)-(8), (10)-(11), (13)-(14)
 These last from three weeks to three months and retrace (i.e. "correct")
 1/3 to 2/3 of the preceding Primary Swing.

THE DOW THEORY -- A SEVEN POINT SUMMARY:

Point (1) The fluctuations of the Dow Jones rail and industrial averages are a composite index of all the hopes, fears, and knowledge of everyone who knows anything of financial matters. They therefore can serve as a barometer of the future. Hamilton wrote: "Consciously or unconsciously the movements of prices reflect not the past but the future. When coming events cast their shadows before, the shadows fall on the New York Stock Exchange."

Rhea believed that students should concentrate their studies on the averages - other statistics could be ignored!

Point (2) The market consists of three movements, which are going on at the same time:

(2A) The Primary Markets. These are the great bull and bear markets. They last from one year to several years. These great movements are fundamental in nature, and are beyond the reach of manipulation.

(2B) Secondary Movements: These moves are called Primary Swings (or legs) when in the direction of the Primary Market. When in the other direction (rallies in bear markets; declines in bull markets) they are called Secondary Reactions. The Secondary Reactions are distinguished from minor changes by their magnitude (usually sufficient to retrace one-third to two-thirds of the preceding primary swing) and by their duration (three weeks to three months.)

(2C) The minor or day-to-day movements. If the Primary Movement is considered a tide, the secondary is similar to the waves that please the surfboard enthusiasts, and the minor movements are the small ripples. The minor movements are not considered important in the Dow Theory.

Point (3) The great bull and bear markets each consist of three phases. These are not related to the secondary movements described above in (2), and should be considered separately:

(3A) In a bull market, the First Phase represents the improvement in public confidence and a correction of the undervaluation developed in the last phase of the preceding bear market.

The Second Phase is a response to improvement in corporate earnings.

The Third Phase is one of rampant speculation, when stocks are advanced on "hopes and expectations."

(3B) In a bear market, the First Phase is a correction of the speculative excesses of the Third Phase of the preceding bull market.

The Second Phase is a deterioration of prices in gear with a slide in the earnings of shares.

The Third Phase is a final depression of prices caused in part by distress selling.

Point (4) The trend can be determined by the action of the secondary swings. Refer to the chart. The rise from point (1) to (2), at the time, might be considered a secondary reaction in the preceding bear market. But when prices turned upward at point (3), which is higher than (1), the picture begins to look bullish. Then, when prices broke through the level of (2) at point (4), the rise is known to be part of a bull market which began at point (1).

In a downward swing, the same type of analysis would be valid. If the drop from (9) to (10), the classification would be "secondary reaction" until the drop at point (11), when the classification becomes dubious. Then, at the breakthrough at point (12), the classification is definitely changed to "Bear Market".

This method of determining trends by "breakthrough" has been aptly compared to the determination of tides by the extent of waves on a sandy beach. If the farthest sweep of a wave is marked on the beach with a stick, and the next wave carries past this point (a breakthrough), the tide is probably rising.

Point (5) In determining the trend in (4), both Industrial and Rail averages must be considered. Changes and break-throughs by one average are not considered signals until the moves are confirmed by the actions of the companion average. The confirming action, however, need not be on the same day.

Point (6) The averages sometimes move horizontally, within a 5% band, for three weeks or longer. When both averages do this, it is called a "Line". When both averages break out of this "line", in the same direction, an important move in the same direction is probable. The breakout is usually made with an increase in volume.

Hamilton noted that "lines" seldom occur at the beginning or ending of secondary swings, but usually in the center.

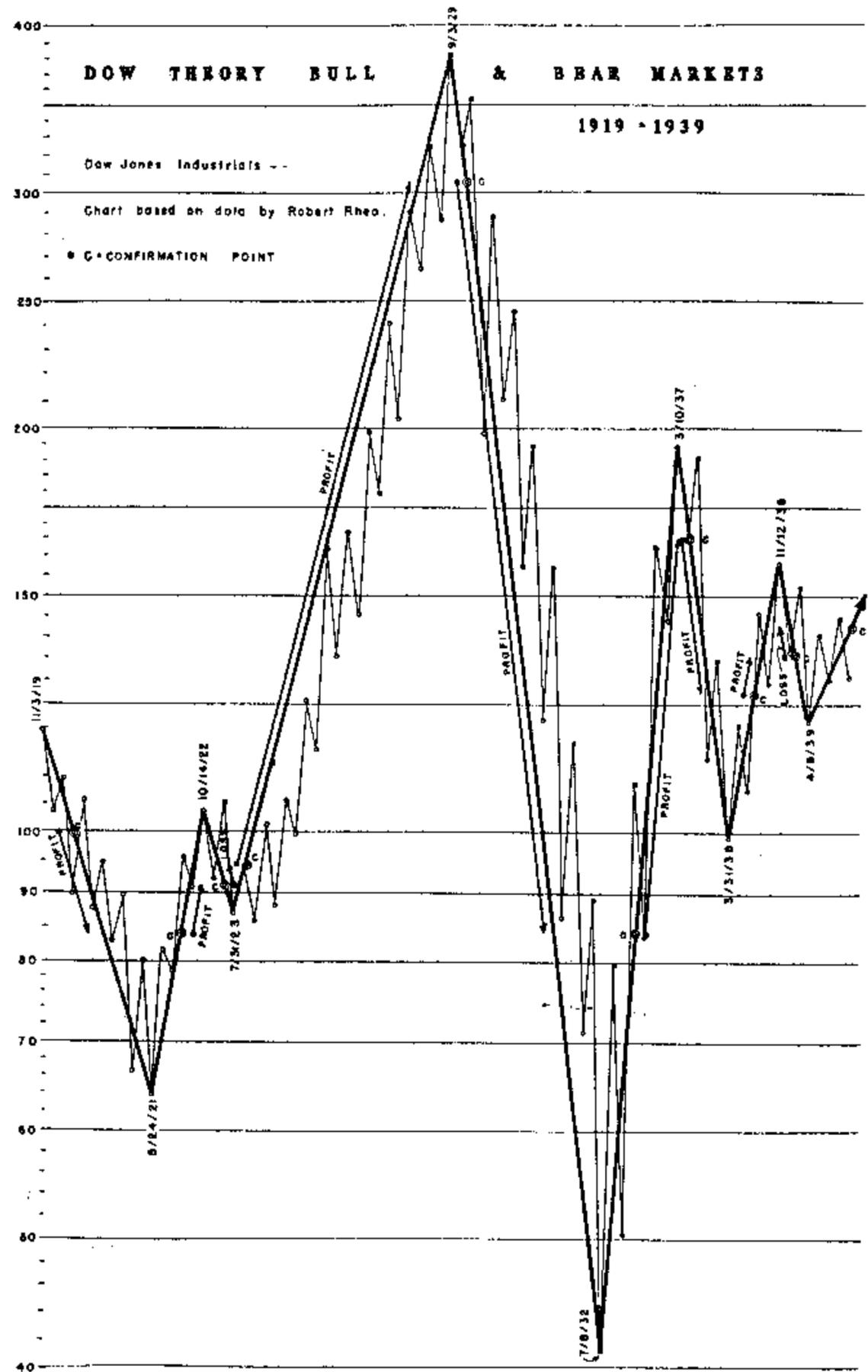
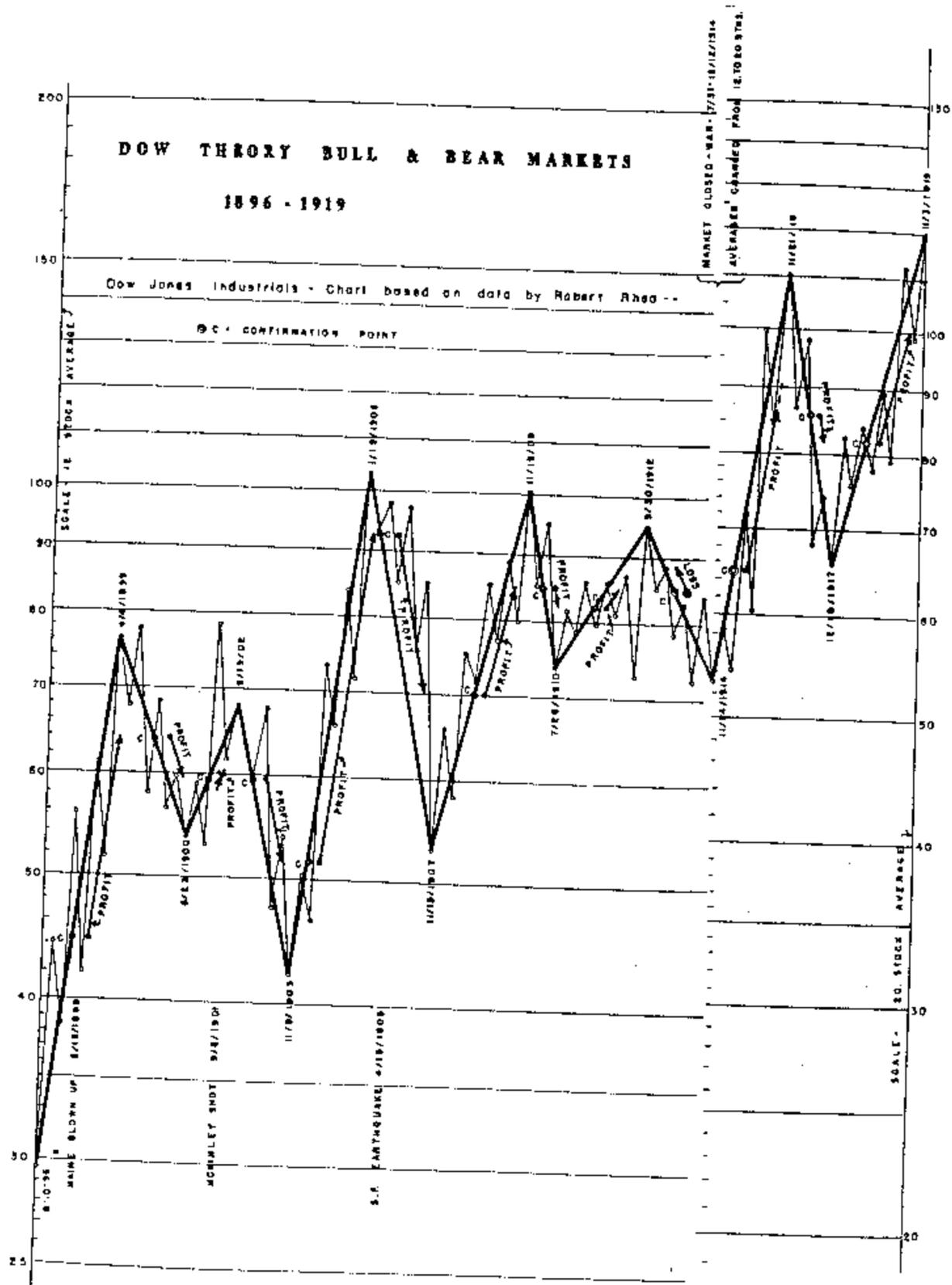
Rhea's analysis recommends the consideration of "lines" of less than 5%. If both averages, for example, have been moving in a 2% band, a breakout from this would be significant.

Rhea found that in a bull market, downside penetrations of "lines" are very speculative, while upside penetrations are more reliable.

Point (7) Volume: A market which is "overbought" becomes dull on rallies and develops activity on declines. Conversely, in "oversold" markets, the tendency is to become dull on declines and active on rallies.

Robert Rhea supplemented Hamilton's tabulations with a detailed listing of all of the bull and bear markets and secondary movements in the period from 1896 to the time of his death in 1939. These tabulations have been charted in the two figures which follow. These trace the Primary Markets with heavy lines; the light lines are the Secondary Movements. In addition, the points of confirmation of the primary markets are marked with the letter "C". Profits and losses obtained by buying and selling at these points of confirmation are indicated by arrows. Since the confirmation always follows the top or the bottom of a primary market, the profits are always less than the total move.

You can profit from this theory. It doesn't always give a correct forecast, and the forecast isn't always clear. But the profits over the years, when cumulated, are the equivalent of compound interest at the rate of 11.7% per year.



DOW THEORY - DATES OF PRIMARY AND SECONDARY
 MOVEMENTS - from Robert Rhea -
 (Prices are D-J Industrial Closing Prices.)

	8/10/96	29.64
Bull	11/9/96	44.08
	4/19/97	38.49
	9/10/97	55.82
	3/25/98	42.00
Bear	8/26/98	60.97
	10/19/98	51.56
	4/4/99	76.04
	5/31/99	67.51
Bull	9/5/99	77.61
	12/18/99	58.27
	2/5/00	68.36
	5/15/00	56.62
Bear	6/1/00	59.38
	6/23/00	53.68
	7/23/00	59.02
	9/24/00	52.96
Bull	6/17/01	78.26
	12/14/01	61.52
	9/19/02	67.77
	12/15/02	59.57
Bear	2/16/03	67.70
	8/8/03	47.38
	8/17/03	53.88
	11/9/03	42.15
Bull	1/27/04	50.50
	3/12/04	46.41
	12/5/04	73.23
	12/12/04	65.77
Bear	4/14/05	83.75
	5/22/05	71.37
	1/19/06	103.00
	3/5/06	92.90
Bull	4/3/06	98.19
	7/13/06	85.18
	10/9/06	96.75
	3/25/07	75.39
Bear	5/3/07	85.02
	11/15/07	53.00
	1/14/08	65.84
	2/13/08	58.62
Bull	5/18/08	75.12
	6/23/08	71.70
	8/10/08	85.40
	9/22/08	77.07
Bear	11/13/08	88.38
	2/23/09	79.91
	11/19/09	100.53

	11/19/09	100.53
Bear	2/8/10	85.03
	3/8/10	94.56
	7/26/10	73.62
	8/17/10	81.41
Bull	9/6/10	78.35
	10/18/10	86.02
	12/6/10	79.68
	2/4/11	86.02
Bear	4/22/11	81.32
	6/19/11	87.06
	9/25/11	72.94
	9/30/12	94.15
Bull	12/11/12	85.25
	1/9/13	88.57
	3/20/13	78.25
	4/4/13	83.19
Bear	6/11/13	72.11
	9/13/13	83.43
	12/24/14	53.17 (a)
	1/23/15	58.52
Bull	2/24/15	54.22
	4/30/15	71.78
	5/14/15	60.38
	12/27/15	99.21
Bear	4/22/16	84.96
	11/21/16	110.15
	2/2/17	87.01
	3/20/17	98.20
Bull	11/8/17	68.58
	11/23/17	74.23
	12/19/17	65.95
	2/19/18	82.08
Bear	4/11/18	75.58
	5/15/18	84.04
	6/1/18	77.93
	10/18/18	89.07
Bull	2/8/19	79.15
	7/14/19	112.23
	8/20/19	98.46
	11/3/19	119.62

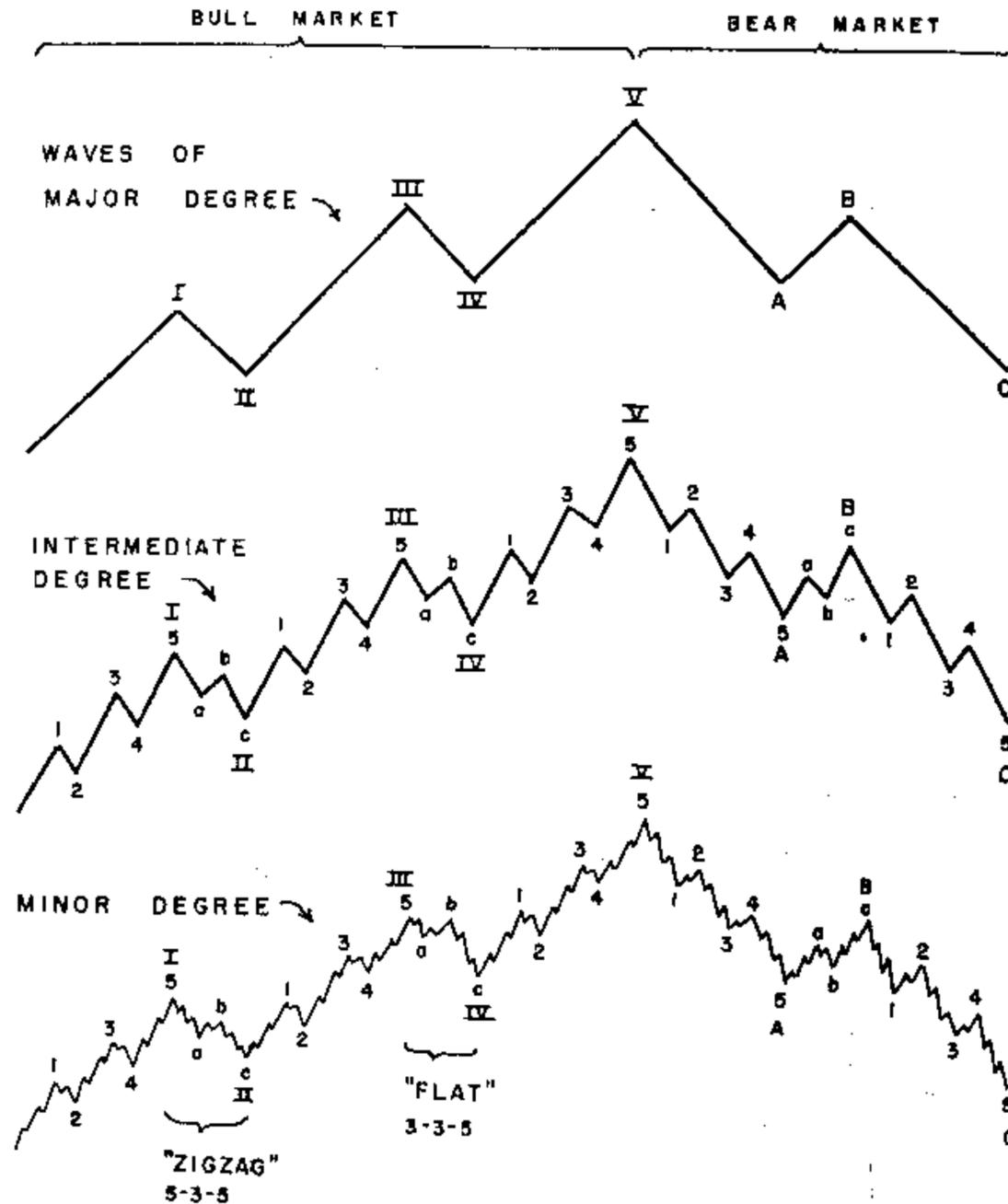
(Note: (a) This is a new series, to be comparable, multiply preceding figures by 0.7339)

DOW THEORY DATES (cont'd)

	11/3/19	119.62
Bear	12/22/19	103.55
	1/3/20	109.88
	2/25/20	89.98
	4/8/20	105.65
Bull	5/19/20	87.36
	7/8/20	94.51
	8/10/20	83.20
	9/17/20	89.95
Bear	12/21/20	66.75
	5/5/21	80.03
	8/24/21	63.90
	12/15/21	81.50
Bull	1/10/22	78.59
	5/29/22	96.41
	6/12/22	90.73
	10/14/22	103.43
Bear	11/21/22	92.03
	3/20/23	105.38
	7/31/23	86.91
	8/29/23	93.70
Bull	10/27/23	85.76
	2/6/24	101.31
	5/20/24	88.33
	8/20/24	105.57
Bear	10/14/24	99.18
	3/6/25	125.68
	3/30/25	115.00
	2/11/26	162.31
Bull	3/30/26	135.20
	8/14/26	166.64
	10/19/26	145.66
	10/3/27	199.78
Bear	10/22/27	179.78
	5/14/28	220.88
	6/18/28	201.96
	11/28/28	295.62
Bull	12/8/28	257.33
	2/5/29	322.06
	5/27/29	293.42
	9/3/29	381.17

	9/3/29	381.17
Bear	10/4/29	325.17
	10/10/29	352.86
	11/13/29	198.29
	4/17/30	294.07
Bull	6/24/30	211.84
	9/10/30	245.09
	12/16/30	157.51
	2/24/31	194.36
Bear	6/2/31	121.70
	6/27/31	156.93
	10/5/31	86.48
	11/9/31	116.79
Bull	1/5/32	71.24
	3/8/32	88.78
	7/8/32	41.22
	9/7/32	79.93
Bear	2/27/33	50.16
	7/18/33	108.67
	10/21/33	83.64
	4/6/36	161.99
Bull	4/29/36	143.65
	3/10/37	194.40
	6/14/37	165.51
	8/14/37	190.02
Bear	11/24/37	113.64
	1/11/38	134.35
	3/31/38	98.95
	4/16/38	121.00
Bull	5/31/38	107.74
	8/6/38	145.67
	9/26/38	129.91
	11/12/38	158.41
Bear	1/26/39	136.42
	3/10/39	152.28
	4/8/39	121.44
	6/10/39	140.14
Bull	6/29/39	130.05
	7/22/39	144.71
	8/24/39	131.33

BASIC ELLIOTT



Appendix VI

WHAT IS THE ELLIOTT WAVE THEORY?

Some refreshing ideas about the behavior of Wall Street were developed by Ralph Nelson Elliott (1871 - Jan. 1948). We have reviewed all of his published writings, and have summarized them in this appendix.

Ralph Elliott spent many years in Latin America as an accountant. In 1927 he retired to Los Angeles where he developed his wave theories. These were published in 1938 in a monograph The Wave Principle, in a series of articles in the Financial World in 1939, and in a book Nature's Law published in 1946. His ideas proved so interesting to investors that he came to New York and spent the last years of his life writing a financial report.

Basically, he believed that prices tend to fluctuate in natural ways. The most important tendencies, he believed, were founded on the Fibonacci series of numbers: 1-1-2-3-5-8-13-21-34-... Each number in this series is equal to the sum of the two preceding numbers, and the ratios are found many places in nature. The count of seeds in the whorls of sunflowers and pineapples are examples. Elliott found the numbers existing in the timing of waves and in the ratios of stock market prices at various turning points.

Elliott's most basic conclusions are illustrated by the chart opposite, which is derived from one that he published in Nature's Law. The tendency that he illustrates is simply that moves in the direction of trend tend to be in five waves; those in the contrary direction tend to be in three waves.

The top chart illustrates the "major" or primary waves in a bull and a bear market. The bull market has five waves; the bear market has three.

The center chart illustrates the tendency toward the breakdown of the primary waves into waves of the next smaller or "Intermediate" degree. Note that each major wave in the direction of trend (up in a bull market; down in a bear market) is made up of five waves of intermediate degree. These are marked 1, 2, 3, 4, 5. Each wave counter to trend is made up of three waves. These are marked a, b, c.

The lower chart is a continuation of the same basic tendency. The longer of the "Intermediate" waves is made up of five waves of minor degree; the shorter of the "intermediate" waves breaks down into three waves of minor degree. An exception is the wave marked "flat".

In the next table and chart, we have summarized and combined all of Elliott's various examples for the period 1929 through 1945. This period spans the time beginning with the first Dow Jones high-low statistics and ending with the last analysis published in "Nature's Law" a few months before his death. The nomenclature has been standardized, in order to make it easier for a student to trace through Elliott's interpretation of the wave patterns.

In addition to his basic conclusions, Elliott listed many variations, which are charted completely on the following pages.

He listed some subsidiary conclusions:

(1) No confirmation is required by a companion average. (The Dow Theory requires confirmation of the Industrials by the Rails.)

(2) Actual high and low figures are used, rather than the closing prices. Elliott said "in fact it was only with the establishment of the daily range in 1928 and the hourly averages in 1932 that sufficient reliable data became available to establish the rhythmic recurrence of the phenomenon called the "Wave Principle."

(3) News has little effect on the course of a wave series. It may affect the amplitude and timing.

(4) Prices tend to move in channels. These can be useful in the interpretation of waves.

(5) Elliott listed his names for the degree of waves in the following order:

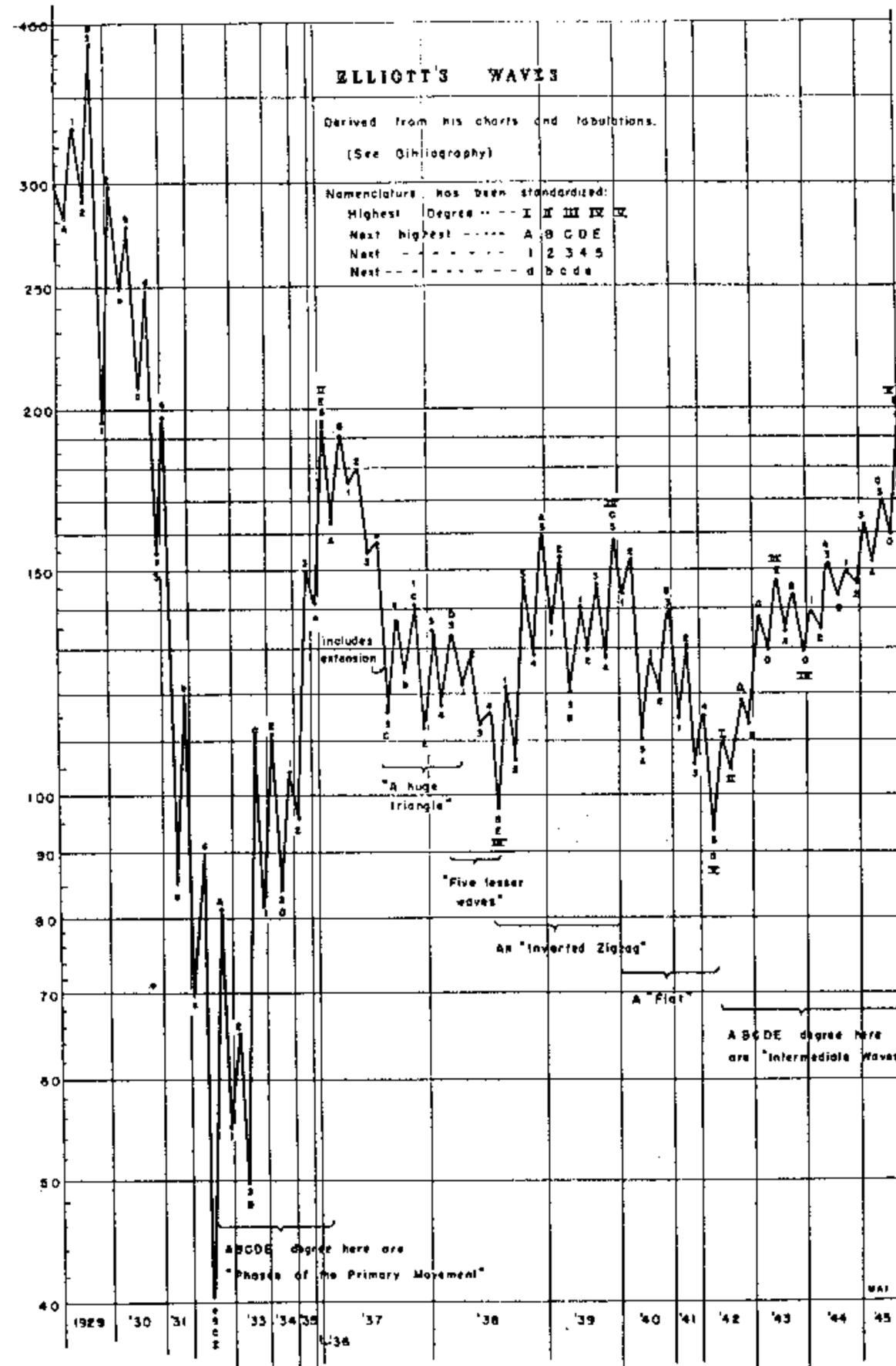
Subminuette (only in the hourly data)
Minuette
Minute
Minor
Intermediate
Primary
Cycle
Super Cycle
Grand Super Cycle

(6) There are many exceptions to the basic pattern.

ELLIOTT'S WAVES
derived from his writings.

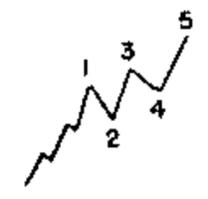
DATE	Elliott's wave:	FW
11 28 28		14.88
03 26 29	A	7.96
05 06 29	1	11.47
05 31 29	2	11.47
09 03 29	3	829.00
11 13 29	1	48.00
04 16 30	2	48.00
05 05 30	a	6.49
05 14 30	b	6.49
06 25 30	c	15.70
09 10 30	d	15.70
12 17 30	3 e	23.40
02 24 31	4	23.40
10 05 31	a	35.05
11 09 31	b	35.05
01 05 32	c	25.36
02 19 32	d	8.91
07 08 32	I C 5 e	829.00
09 08 32	A	60.85
12 03 32	1	16.91
01 11 33	2	16.91
02 27 33	B 3	60.85
07 18 33	C	30.83
10 21 33	1	30.83
02 05 34	2	30.00
07 26 34	D 3	30.00
12 06 34	1	
03 18 35	2	11.13
11 20 35	3	7.28
04 30 36	4	14.38
03 10 37	II E 5	109.29
06 17 37	A	15.82
08 14 37	B	15.82
08 27 37	1	
08 31 37	2	
09 13 37	3	5.64
09 30 37	4	6.15
10 19 37	C 5	18.20
10 21 37	a	8.26
10 25 37	b	8.26
10 29 37	1 c	18.20
11 23 37	2	18.71
01 15 38	3	18.71
02 04 38	4	12.69
02 23 38	D 5	12.69
03 12 38	1	
03 15 38	2	
03 23 38	3	

DATE	Elliott's wave:	FW
03 24 38	4	
03 31 38	III E 5	60.42
04 18 38	1	13.17
05 27 38	2	13.17
07 25 38	3	
09 28 38	4	13.77
11 10 38	A 5	60.42
01 26 39	1	11.71
03 10 39	2	11.71
04 11 39	B 3	29.12
06 09 39	1	8.48
06 30 39	2	8.48
08 03 39	3	
09 01 39	4	12.56
09 13 39	IV C 5	29.12
01 15 40	1	5.71
04 08 40	2	5.71
06 10 40	A 3	24.42
08 12 40	1	
08 16 40	2	
11 08 40	B 3	24.42
05 01 41	1	13.64
07 22 41	2	13.64
12 24 41	3	7.78
01 06 42	4	7.78
04 28 42	V C 5	109.29
07 15 42	I	
08 05 42	II	
11 09 42	A	
11 24 42	B	
04 06 43	C	5.18
04 13 43	D	5.18
07 15 43	III E	12.96
08 02 43	A	6.10
09 20 43	B	6.10
11 30 43	IV C	12.96
01 11 44	1	
04 25 44	2	
07 10 44	A 3	5.35
09 07 44	B	5.35
10 06 44	1	
11 16 44	2	
03 06 45	3	6.37
03 26 45	4	6.37
06 26 45	C 5	5.51
07 27 45	D	5.51
12 10 45	V E	

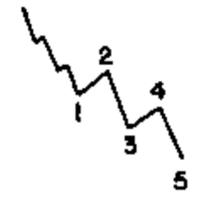


ELLIOTT VARIATIONS - IN LINE OF TREND-

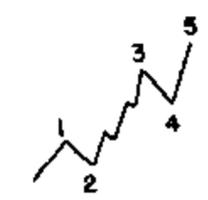
Elliott found that waves in the line of trend (1, 3, 5) sometimes elongated into five waves of the same degree - rather than breaking down into five waves of a lower degree. This elongation could occur in waves 1, 3, or 5, but not in waves 2 or 4. It usually occurred in the last or fifth wave. He called these elongations extensions.



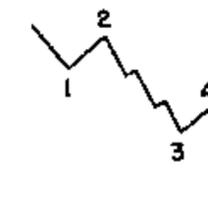
Extension in Wave 1, upward trend.



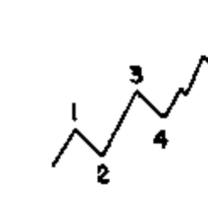
Extension in Wave 1, downward trend.



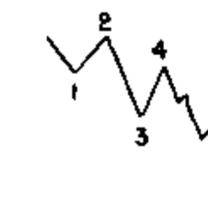
Extension in Wave 3, upward trend.



Extension in Wave 3, downward trend.



Extension in Wave 5, upward trend.



Extension in Wave 5, downward trend.

ELLIOTT VARIATIONS - IN LINE OF TREND

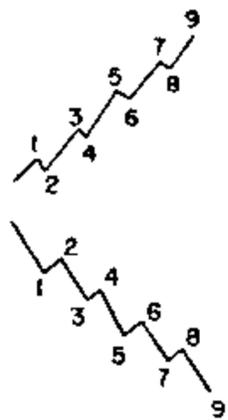
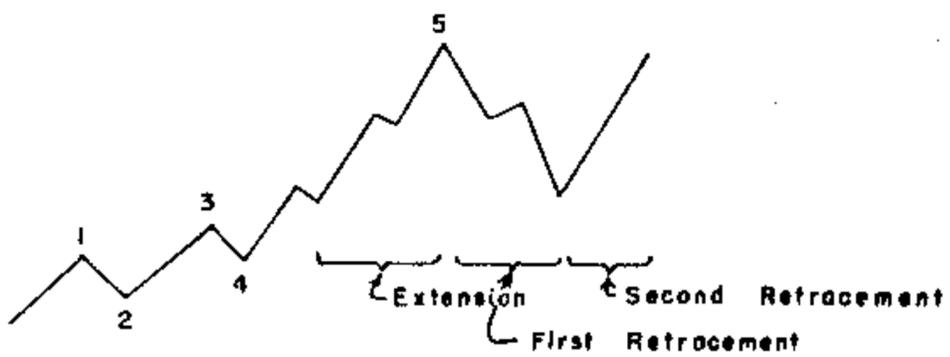
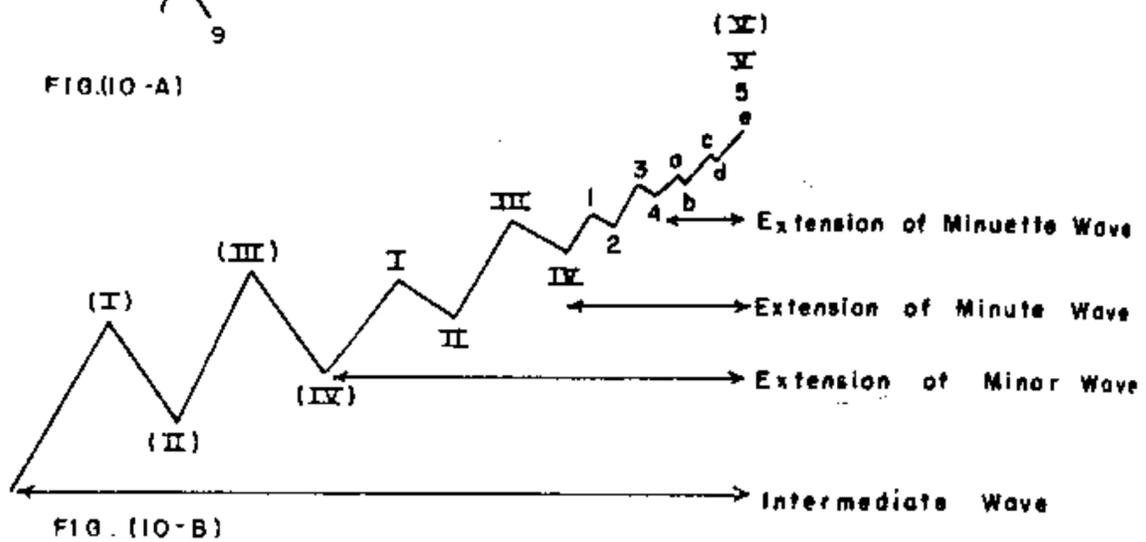


FIG.(10-A)



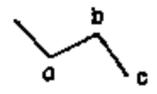
Since extensions are comparable with the other waves in a series, they may be equal to them and the entire movement may seem to be nine waves of about equal size. (top chart)

At the end of a major move, there may be a series of extensions of extensions in the fifth wave. The move comes to an end finally on the last minuette wave of the last minute wave of the last minor wave of the last intermediate wave. (Middle chart)

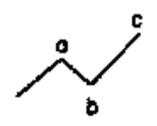
Elliott found that extensions tend to be "double-retraced" i. e. by a downward and then by an upward move. (lower chart) This is interesting only in an extension of the fifth wave, since an extension in the first wave is retraced by the second and third waves and an extension in the third wave is retraced by the fourth and fifth waves.

ELLIOTT VARIATIONS - CORRECTIONS

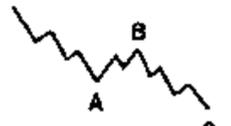
ZIGZAGS



MINOR



MINOR - INVERTED



INTERMEDIATE



INTERMEDIATE INVERTED



MAJOR - A DOUBLE ZIGZAG



MAJOR - INVERTED

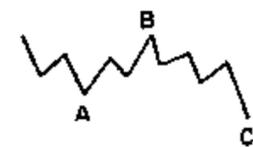
Elliott recognized corrections of five types: zigzag, flat, irregular, triangular, and complex.

Three sizes of "Zigzags" are illustrated on this page. In the minor size, each wave is single; in the intermediate size, the distribution is the usual 5-3-5 found in the "Basic Elliott" chart. In the major size the two longer waves are doubled.

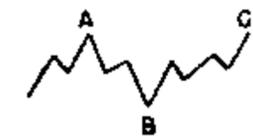
Note that the "inverted" versions are included. These are corrections of a downward trend.

ELLIOTT VARIATIONS - CORRECTIONS

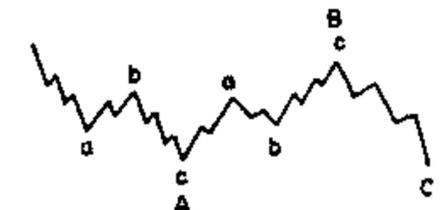
FLATS



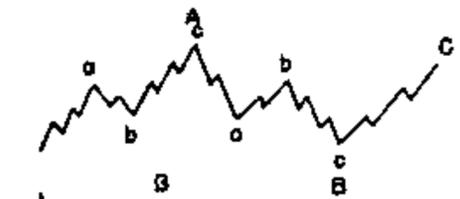
MINOR



MINOR - INVERTED



INTERMEDIATE -



INTERMEDIATE - INVERTED



MAJOR



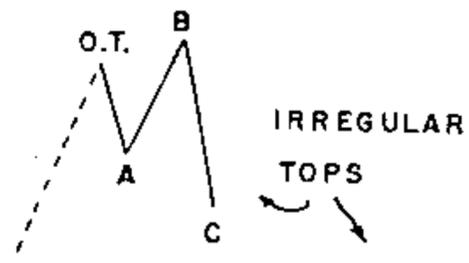
MAJOR - INVERTED

In a zigzag the pattern is 5-3-5; in a flat it is 3-3-5. This gives the "flat" correction a level appearance - and its name.

Examples of this correction are in this figure. An example, also, is marked in the Basic Elliott chart at the beginning of this appendix. A "Zigzag" is also marked for comparison.

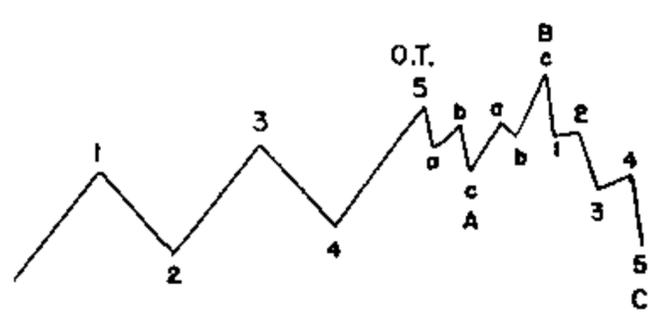
ELLIOTT VARIATIONS - CORRECTIONS

IRREGULAR

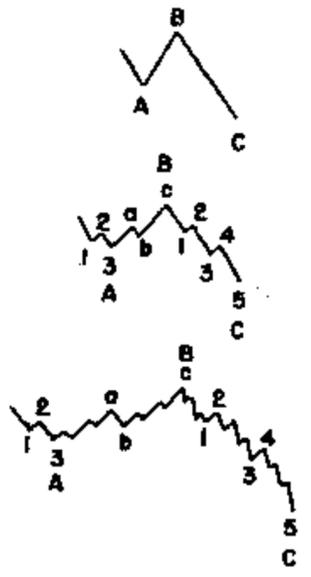


"Irregular corrections" are distinguished by the height of the "B" wave, which advances to another top higher than the orthodox top ("O. T").

Since the correction makes a new top, it is also called an "irregular top". An example is the 1929 peak.



Normally "C" terminates below the bottom of "A". Liquidation in the third or "C" wave is usually more intensive than in the first wave.



MINOR

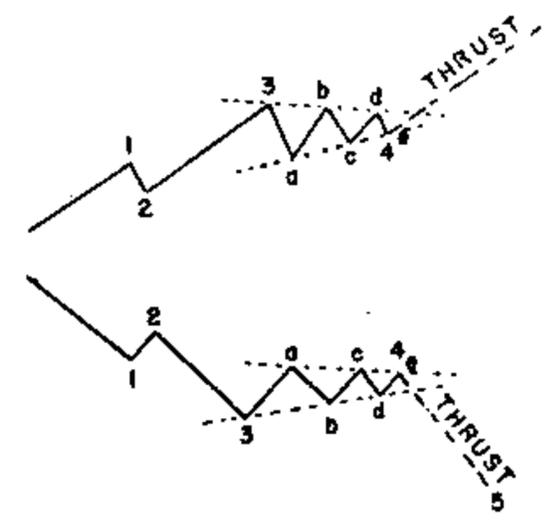
INTERMEDIATE

MAJOR

(In the larger and more important corrections the "C" wave may consist of three smaller five-wave sets.)

ELLIOTT VARIATIONS - CORRECTIONS

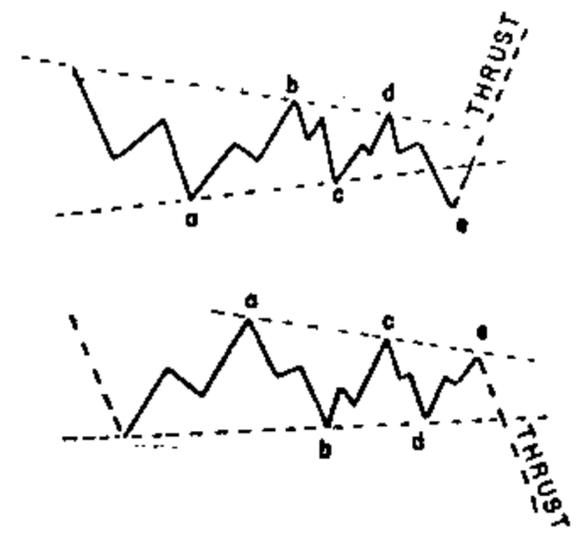
TRIANGLES



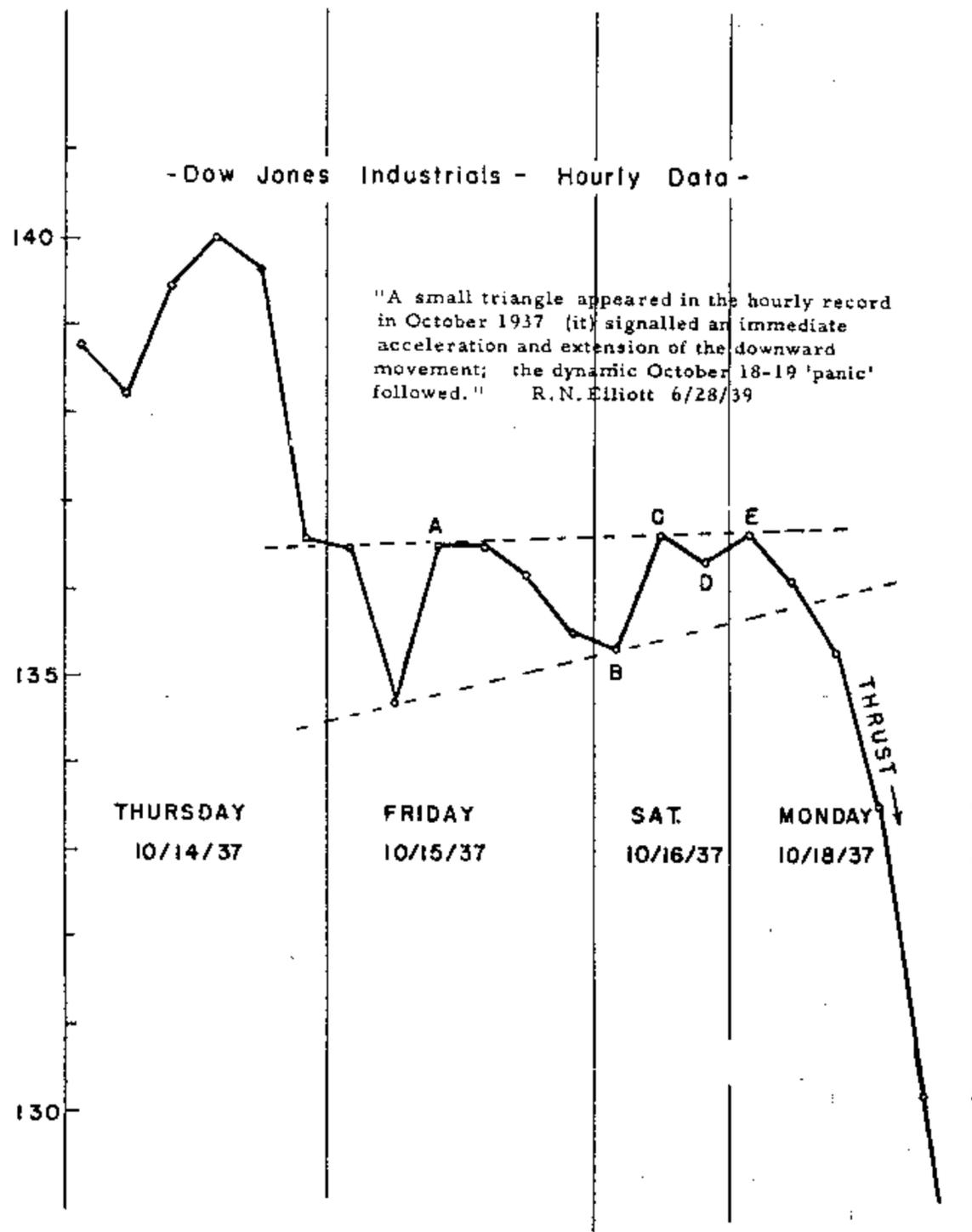
Triangular corrections have five waves or legs each of which has no more than three lesser waves. In the small triangles the legs can be single waves.

Triangles are found in the fourth wave of a five wave movement - exclusively. They form the base for the fifth wave or "thrust".

One of the boundaries of a triangle may be horizontal. The fifth leg may terminate within or outside of the boundaries.

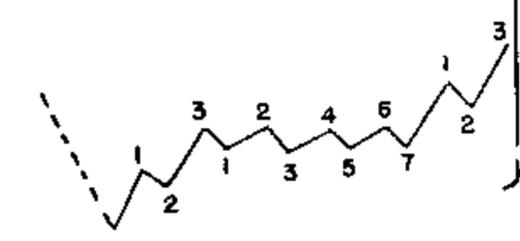
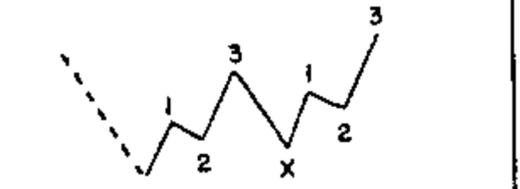
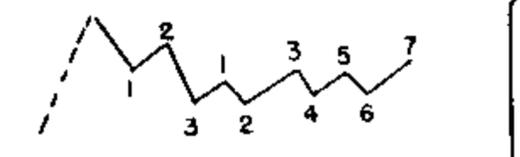
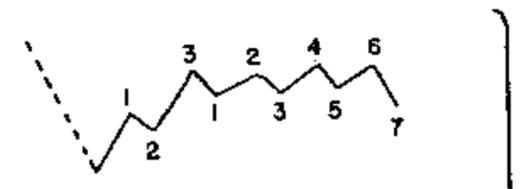
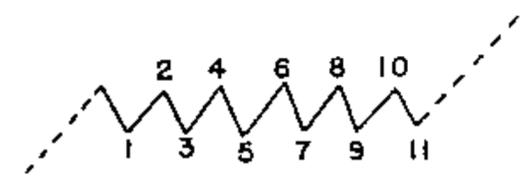
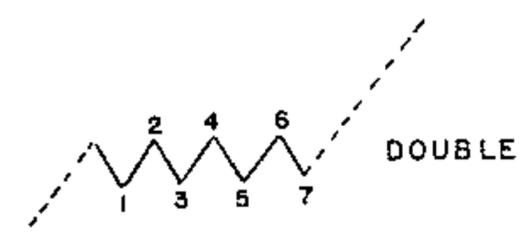


Triangles have been as short as seven hours (a short example is on the next page) and as long as 13 years. Hamilton Bolton outlined a 21 year triangle in his writings.



ELLIOTT VARIATIONS - CORRECTIONS

COMPLEX



This group includes some final complex variations. In the words of Elliott: "The rhythm of corrective movements is the most difficult feature of the wave principle."

DOUBLE THREES
MIXED-UPWARD &
DOWNWARD

Elliott had some problems in the application of his principle. Many of his turning points were debatable; his wave patterns tend to proliferate into variations.

The selection of turning points is crucial. You can identify almost any pattern if you select the proper turning points. When filtered waves are applied, some of Elliott's turning points appear to be quite light, and he seems to have missed some important turns.

Another problem is the division of waves into subwaves. You can divide a wave into almost any number of subwaves, if you make the subwaves small enough.

We have tried to read Elliott's mind, from his limited writings, in order to develop a basis for a measured analysis:

(1) In the breakdown of waves into subwaves, the first and most promising line of attack is a study of Elliott's own examples. The turning points that he used have been tabulated and evaluated, and the average wave amplitude has been measured.

(2) A second line of attack is a study of the "basic Elliott" chart at the beginning of this appendix. This chart outlines a complete cycle. If you will count the number of waves of major degree, intermediate degree, and minor degree, you will find the following:

Major degree: 8 waves
 Intermediate degree: 34 waves (4.25 times as many)
 Minor degree: 142 waves (4.18 times as many as in the intermediate degree.)

Using this as a guide, we counted down the rank of turning point FW numbers:

FW	Number of turning points:
80%	4
40%	10
20%	44
10%	170
5%	540

The frequencies in the Basic Elliott chart of 8, 34 and 142 are similar in proportion to the actual count in the selected groups of 10, 44, and 170.

(3) A third possible approach is based on Elliott's statement that "a wave is divided into waves of the next smaller degree." If waves (or turning points) are ranked in any given period of time, from the highest FW to the lowest, and the rank is scanned downward, you will find at a certain point that the waves are parts of preceding waves. This is evidence that you are moving into a sub-wave classification.

For example, the ten most important turning points in the period 1928-1962 are the following:

Rank:	Date:	FW:
(1)	09 03 29	829.00
(2)	07 08 32	829.00
(3)	03 06 37	109.29
(4)	04 28 42	109.29
(5)	09 08 32	60.85
(6)	02 27 33	60.85
(7)	03 31 38	60.42
(8)	11 10 38	60.42
(9)	11 13 29	48.00
(10)	04 16 30	48.00

You will find that numbers (7) and (8) are, in time, between (3) and (4), and evidently form a subwave. No. (9) and (10) are between (1) and (2) and evidently form a subwave. A similar method was used to check the other groupings.

The three approaches outlined above were combined and cross checked to yield the following proposed classification:

	FW:	Elliott Wave:
Cycle	80	I, II, III, IV...
Primary	40	A, B, C, D...
Intermediate	20	1, 2, 3, 4...
Minor	10	a, b, c, d...
Minute	5	

Appendix VII

CLASSIFICATION USED BY DERNELL EVERY :

HL-HH <u>BUY</u> 1.	HH-HL <u>BUY</u> 2.	HL-SH 3.	SH-HL 4.	HL-LH <u>GOOD</u> 5.	LH-HL <u>POOR</u> 6.
SL-HH 7.	HH-SL 8.	SL-SH 9.	SH-SL 10.	SL-LH 11.	LH-SL 12.
LL-HH <u>GOOD +</u> 13.	HH-LL <u>POOR -</u> 14.	LL-SH 15.	SH-LL 16.	LL-LH <u>SELL</u> 17.	LH-LL <u>SELL</u> 18.

HH = HIGHER HIGHS SH = SAME HIGHS LH = LOWER HIGHS
HL = HIGHER LOWS SL = SAME LOWS LL = LOWER LOWS

This classification is used with charts of on-balance-volume.

- YEAR TYPE LETTER -

Go down column to first three digits of year
then across to column of fourth digit,
and obtain Year Type Letter.

	O	1	2	3	4	5	6	7	8	9
175	A	B	A	B	C	K	F	G	A	
176	I	D	E	F	N	B	C	D	L	G
177	A	B	J	E	F	G	H	C	D	E
178	M	A	B	C	K	F	G	A	I	D
179	E	F	N	B	C	D	L	G	A	B
180	C	D	E	F	N	B	C	D	L	G
181	A	B	J	E	F	G	H	C	D	E
182	M	A	B	C	K	F	G	A	I	D
183	E	F	N	B	C	D	L	G	A	B
184	J	E	F	G	H	C	D	E	M	A
185	B	C	K	F	G	A	I	D	E	F
186	N	B	C	D	L	G	A	B	J	E
187	F	G	H	C	D	E	M	A	B	C
188	K	F	G	A	I	D	E	F	N	B
189	C	D	L	G	A	B	J	E	F	G
190	A	B	C	D	L	G	A	B	J	E
191	F	G	H	C	D	E	M	A	B	C
192	K	F	G	A	I	D	E	F	N	B
193	C	D	L	G	A	B	J	E	F	G
194	H	C	D	E	M	A	B	C	K	F
195	G	A	I	D	E	F	N	B	C	D
196	L	G	A	B	J	E	F	G	H	C
197	D	E	M	A	B	C	K	F	G	A
198	I	D	E	F	N	B	C	D	L	G
199	A	B	J	E	F	G	H	C	D	E
200	M	A	B	C	K	F	G	A	I	D
201	E	F	N	B	C	D	L	G	A	B
202	J	E	F	G	H	C	D	E	M	A
203	B	C	K	F	G	A	I	D	E	F
204	N	B	C	D	L	G	A	B	J	E
205	F	G	H	C	D	E	M	A	B	C

CALENDAR 1753-2059

TO USE: FIRST: OBTAIN YEAR TYPE LETTER
FROM OPPOSITE PAGE,
THEN FIND MONTH,
GO STRAIGHT ACROSS TO YEAR TYPE LETTER,
THEN DOWN TO CALENDAR.

JAN. 31d	E	L	G	N	D	K	A	H	C	J	B	I	F	M	31d JAN.
FEB. 28-29	B	J	D	K	A	H	E	L	G	N	F	M	C	J	28-29 FEB.
MAR. 31d	B	H	D	J	A	N	E	K	G	M	F	L	C	I	31d MAR.
APR. 30d	F	L	A	N	E	K	B	H	D	J	C	I	G	M	30d APR.
MAY 31d	D	J	F	L	C	I	G	M	B	H	A	N	E	K	31d MAY
JUNE 30d	A	N	C	I	G	M	D	J	F	L	E	K	B	H	30d JUNE
JULY 31d	F	L	A	N	E	K	B	H	D	J	C	I	G	M	31d JULY
AUG. 31d	C	I	E	K	B	H	F	L	A	N	G	M	D	J	31d AUG.
SEP. 30d	G	M	B	H	F	L	C	I	E	K	D	J	A	N	30d SEP.
OCT. 31d	E	K	G	M	D	J	A	N	C	I	B	H	F	L	31d OCT.
NOV. 30d	B	H	D	J	A	N	E	K	G	M	F	L	C	I	30d NOV.
DEC. 31d	G	M	B	H	F	L	C	I	E	K	D	J	A	N	31d DEC.

EXAMPLE:
JULY 4, 1776
YEAR TYPE: H
DAY OF WEEK: THURSDAY

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Appendix IX

ELAPSED TIME CALCULATOR

DAY OF MONTH	DAY OF THE YEAR											
	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEP.	OCT.	NOV.	DEC.	JAN.	FEB.
1	1	32	62	93	123	154	185	215	246	276	307	338
2	2	33	63	94	124	155	186	216	247	277	308	339
3	3	34	64	95	125	156	187	217	248	278	309	340
4	4	35	65	96	126	157	188	218	249	279	310	341
5	5	36	66	97	127	158	189	219	250	280	311	342
6	6	37	67	98	128	159	190	220	251	281	312	343
7	7	38	68	99	129	160	191	221	252	282	313	344
8	8	39	69	100	130	161	192	222	253	283	314	345
9	9	40	70	101	131	162	193	223	254	284	315	346
10	10	41	71	102	132	163	194	224	255	285	316	347
11	11	42	72	103	133	164	195	225	256	286	317	348
12	12	43	73	104	134	165	196	226	257	287	318	349
13	13	44	74	105	135	166	197	227	258	288	319	350
14	14	45	75	106	136	167	198	228	259	289	320	351
15	15	46	76	107	137	168	199	229	260	290	321	352
16	16	47	77	108	138	169	200	230	261	291	322	353
17	17	48	78	109	139	170	201	231	262	292	323	354
18	18	49	79	110	140	171	202	232	263	293	324	355
19	19	50	80	111	141	172	203	233	264	294	325	356
20	20	51	81	112	142	173	204	234	265	295	326	357
21	21	52	82	113	143	174	205	235	266	296	327	358
22	22	53	83	114	144	175	206	236	267	297	328	359
23	23	54	84	115	145	176	207	237	268	298	329	360
24	24	55	85	116	146	177	208	238	269	299	330	361
25	25	56	86	117	147	178	209	239	270	300	331	362
26	26	57	87	118	148	179	210	240	271	301	332	363
27	27	58	88	119	149	180	211	241	272	302	333	364
28	28	59	89	120	150	181	212	242	273	303	334	365
29	29	60	90	121	151	182	213	243	274	304	335	366
30	30	61	91	122	152	183	214	244	275	305	336	
31	31		92		153	184		245		306	337	

To find number of days between two dates:

- (1) Put down 365, for each Feb. 28 passed over.
(For a leap year Feb. 29 use 366.)
- (2) Add "Day of the year" for the second date.
- (3) Subtract "Day of the year" for the first date.
- (4) Remainder is the number of days between the two dates.

Example: April 24, 1962 to March 12, 1964

- | | |
|-----------|------------------------|
| (1) + 365 | (For Feb. 28, 1963) |
| + 366 | (For Feb. 29, 1964) |
| (2) + 12 | (For March 12, 1964) |
| 743 | (Total) |
| (3) - 55 | (For April 24, 1962) |
| 688 | (Elapsed time in days) |

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Appendix X

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Appendix X

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