INTRODUCTION TO THE WAVE PRINCIPLE OF HUMAN SOCIAL BEHAVIOR

by

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R.N. ELLIOTT'S DISCOVERY

In the 1930s, Ralph Nelson Elliott discovered that stock market prices trend and reverse in recognizable patterns.[1] The patterns he discerned are repetitive in *form*, but not necessarily in time or amplitude. Elliott isolated thirteen such patterns, or "waves," that recur in market price data. He named, defined and illustrated the patterns. He then described how they link together to form larger versions of themselves, how they in turn link to form the same patterns at the next larger size, and so on, producing a structured progression. He called this phenomenon The Wave Principle.

Many areas of mass human activity display the Wave Principle, but it is most popularly applied to stock market averages, partly because of the voluminous data available and partly because they are considered by many people to be important, which is precisely why there is so much data available. Actually, the stock market is far more significant to the human condition than it appears to casual observers and even to those who make their living by it. The level of aggregate stock prices is a direct and immediate measure of the popular valuation of man's total productive capability. That this valuation has *form* is a fact of profound implications that should ultimately revolutionize the social sciences.

While Elliott progressed from evidence to patterns, it is far easier to approach the idea by reviewing the patterns first. That is how we shall proceed here.

BASIC TENETS OF THE WAVE PRINCIPLE

The Five-Wave Pattern

In markets, progress ultimately takes the form of five waves of a specific structure.[2] Three of these waves, which are labeled (1), (3) and (5) in Figure 1, actually effect the directional movement. They are separated by two countertrend interruptions, which are labeled (2) and (4). The two interruptions are apparently a requisite for overall directional movement to occur.
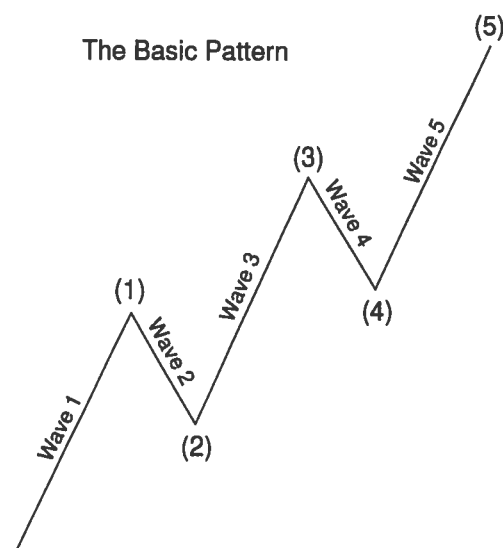

The Basic Pattern

Figure 1

Elliott noted three consistent aspects of the five-wave form. They are: Wave two never moves beyond the start of wave one; wave three is never the shortest wave; and wave four never enters the price territory of wave

one. (He also noted numerous aspects of the five-wave form that were often, but not always, manifest, as detailed in the literature.) At any time, the market may be identified as being somewhere in the basic five-wave pattern at the largest degree of trend. Because the five-wave pattern is the overriding form of market progress, all other patterns are subsumed by it.

Wave Mode

There are two modes of wave development: *motive* and *corrective*. Motive waves have a *five*-wave structure, while corrective waves have a *three*-wave structure or a variation thereof. Motive mode is employed by both the five-wave pattern of Figure 1 *and* its same-directional components, i.e., waves (1), (3) and (5). Their structures are called "motive" because they powerfully impel the market. Corrective mode is employed by all countertrend interruptions, which include waves (2) and (4) in Figure 1. Their structures are called "corrective" because each one appears as a response to the preceding motive wave yet accomplishes only a partial retracement, or "correction," of the progress it achieved. Thus, the two modes are fundamentally different, both in their roles and in their construction.

The Complete Cycle

One complete cycle of eight waves, then, is made up of two distinct phases, the five-wave motive phase (also called a "five"), whose subwaves are denoted by numbers, and the three-wave corrective phase (also called a "three"), whose subwaves are denoted by letters. Just as wave (2) corrects wave (1) in Figure 1, the greater detail of Figure 2 shows that the sequence a, b, c corrects the sequence 1, 2, 3, 4, 5.

Structure and Degree

When an initial eight-wave cycle such as shown in Figure 2 ends, a similar cycle ensues, which is then followed by another five-wave movement. This entire development produces a five-
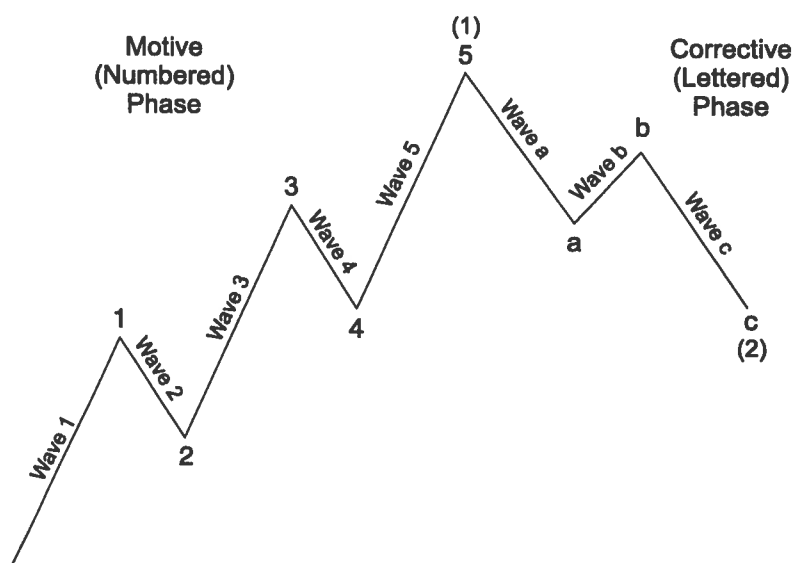

Figure 2

wave pattern of *one degree larger* than the waves of which it is composed. The result is shown in Figure 3 up to the peak labeled (5).

This five-wave pattern of larger degree is then corrected by a three-wave pattern of corresponding degree. The entire process completes another, yet larger, cycle, as shown in Figure 3. As Figure 3 illustrates, then, *each same-direction component of a motive wave* (i.e., wave one, three or five) *and each full-cycle component* (i.e., waves one + two, or waves three + four) *of a complete cycle, is a smaller version of itself.*

① and ② = 2 waves
(1), (2), (3), (4), (5), (a), (b), (c) = 8 waves
1, 2, 3, 4, 5, a, b, c, etc. = 34 waves

Figure 3

It is necessary to understand a crucial point: Figure 3 not only illustrates a *larger* version of Figure 2, it also illustrates *Figure 2 itself*, in greater detail. In Figure 2, each subwave 1, 3 and 5 is a motive wave that will subdivide into a "five," and each subwave 2 and 4 is a corrective wave that will subdivide into a "three." Waves 1 and 2 in Figure 3, if examined under a "microscope," would take the same form as waves (1) and (2), and in further detail, waves ① and ②. Regardless of degree, the form is constant. We can use Figure 3 to illustrate two waves, eight waves or thirty-four waves, depending upon the degree to which we are referring.

The Essential Design

Now observe that within the corrective pattern illustrated as wave ② in Figure 3, waves (a) and (c), which point downward, are each composed of five waves: 1, 2, 3, 4 and 5. Similarly, wave (b), which points upward, is composed of three waves: a, b and c. This construction discloses a second crucial point: that motive waves do not always point upward, and corrective waves do not always point downward. The mode of a wave is determined not by its absolute direction but primarily by its *relative* direction. Aside from four specific exceptions, which are discussed in the literature, waves divide in *motive* mode (five waves) when trending in the same direction as the wave of one larger degree of which they are a part, and in *corrective* mode (three waves or a variation) when trending in the opposite direction. Waves (a) and (c) are motive, trending in
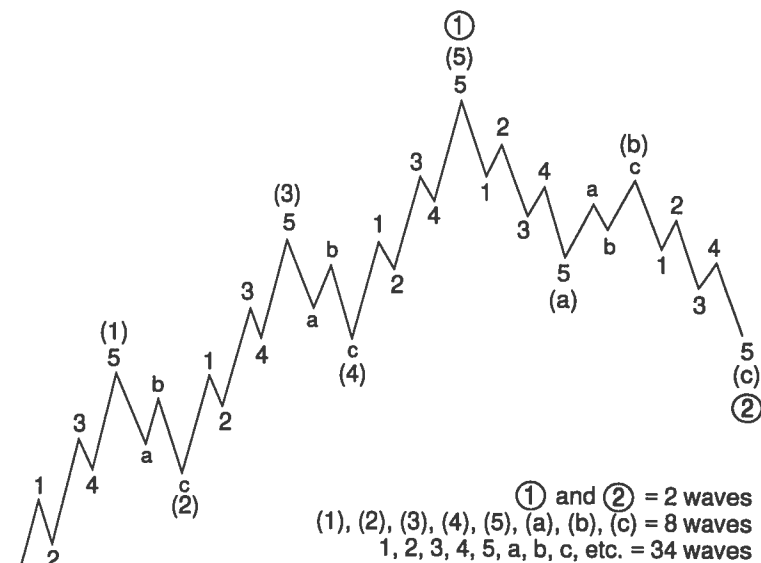
the *same direction* as wave ②. Wave (b) is corrective because it corrects wave (a) and is *counter-trend* to wave ②. In summary, the essential underlying tendency of the Wave Principle is that *action in the same direction as the one larger trend develops in five waves, while reaction against the one larger trend develops in three waves,* at all degrees of trend.

The phenomena of *form, degree* and *relative direction* are carried one step further in Figure 4. This illustration reflects the general principle that in any market cycle, waves will subdivide as shown in the table below.
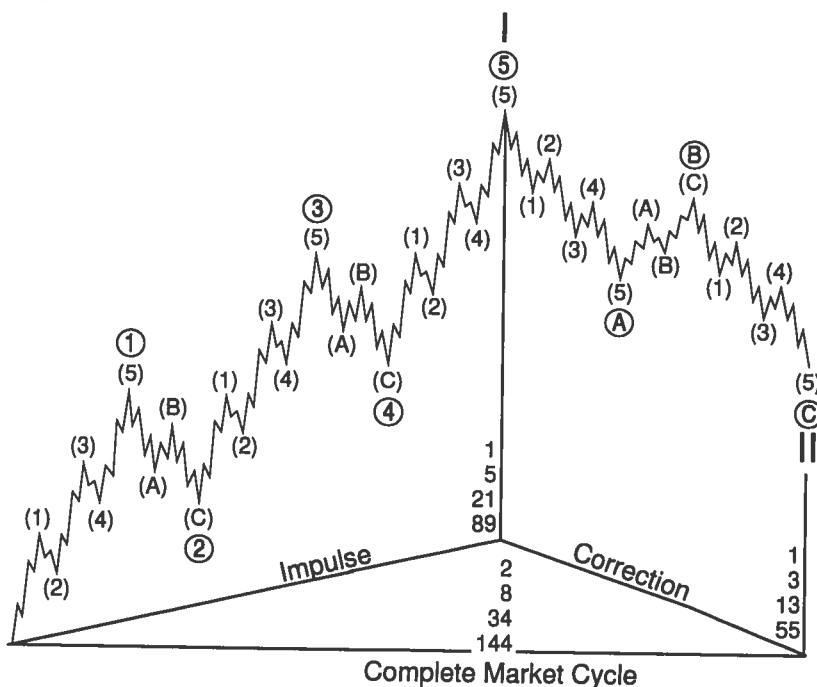
Impulse   Correction

Complete Market Cycle

Figure 4

Number of Waves at Each Degree					
	Impulse	+	Correction	=	Cycle
Largest waves	1		1		2
Largest subdivisions	5		3		8
Next subdivisions	21		13		34
Next subdivisions	89		55		144 , etc.

As with Figures 2 and 3, neither does Figure 4 imply finality. This larger cycle automatically becomes two subdivisions of the wave of *next* higher degree. As long as progress continues, the process of building to greater degrees continues. The reverse process of subdividing into lesser degrees apparently continues indefinitely as well. As far as we can determine, then, all waves both *have* and *are* (or at the largest degree, *will be*) component waves.

Elliott himself never speculated on why the market's essential form was five waves to progress and three waves to regress. He simply noted that it was happening. Does the essential form have to be five waves and three waves? Think about it and you will realize that this is *the* minimum requirement for, and therefore the most efficient method of, achieving both *fluctuation* and *progress* in linear movement when only form, and not length, is considered. *One* wave does not allow *fluctuation*. The fewest subdivisions to create fluctuation is three waves. Three waves *in both directions* does not allow *progress*. To progress in one direction despite periods of regress, movements in the main trend must be at least five waves, simply to cover more ground than the three waves and still contain fluctuation. While there could be more waves than that, the most efficient form of punctuated progress is 5-3, and nature typically follows the most efficient path.

The Fibonacci Sequence and the Stock Market

The Fibonacci sequence (1, 1, 2, 3, 5, 8, 13, 21, 34, 55...) and ratio (.618034...) appear ubiquitously in natural forms ranging from the geometry of the DNA molecule to the physiology of plants and animals. As Elliott explained in his final unifying conclusion, the progress of waves has the same mathematical base as these other phenomena of life. The Fibonacci sequence governs the number of waves that form in the movement of aggregate stock prices in an expansion upon the underlying 5:3 relationship described above. Figure 5 shows the progression. The simplest expression of a correction is a straight line decline. The simplest expression of an impulse is a straight line advance. A complete cycle is two lines. At the next degree of complexity, the corresponding numbers are 3, 5 and 8. This sequence can be taken to infinity. The fact that waves reflect the Fibonacci sequence suggests that *man's collectively expressed emotions are keyed to this mathematical law of nature.*
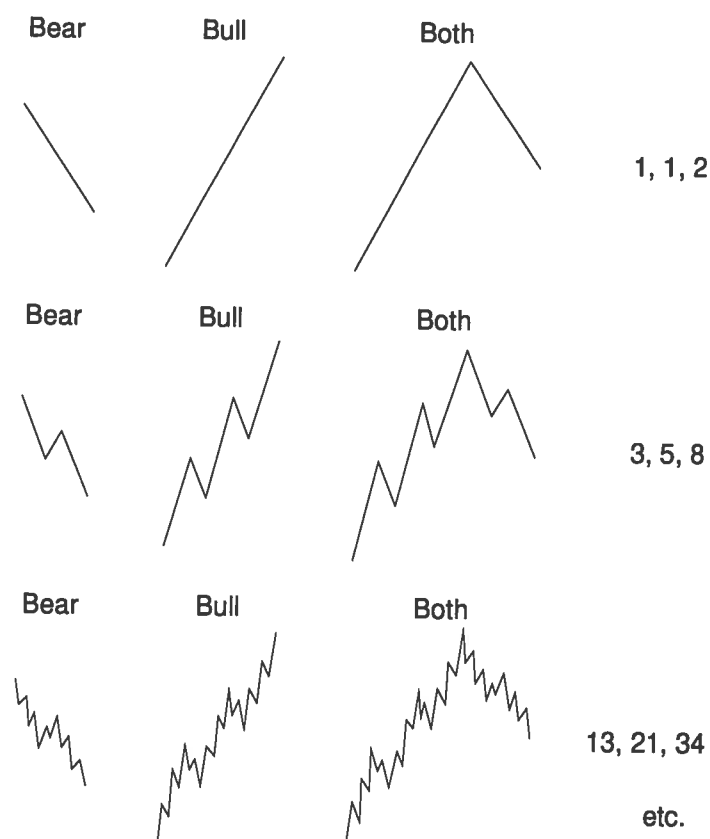

Figure 5

SOME KEY PRACTICAL ASPECTS

The practical value of the Wave Principle is that it provides a context for analyzing and forecasting both the stock market and the larger forces of social mood that are apparently behind its movement. A proper identification of the patterns imparts an immense amount of knowledge about the market's position within its behavioral continuum and therefore about its probable ensuing path.

Variations on the Basic Theme

The Wave Principle would be simple to apply if the essential design described above were the complete description of market behavior. The real world, fortunately or unfortunately, is not so simple. There are a number of specific variations on this underlying theme, which Elliott meticulously described and illustrated. He also noted the important fact that each pattern has identifiable *tendencies* as well as *requirements*. From these observations, he was able to formulate numerous descriptions of typical wave behavior and therefore guidelines for proper wave identification. A thorough understanding of such details is necessary to understand what the market can do, and at least as important, what it does not do. However, as the purpose of this paper is limited to introducing the general hypothesis, a discussion of such nuances is omitted. Some readers may wish to peruse a short list of fine points in order to understand more precisely the reasons behind some aspects of the labeling in the graphs that follow.[1]

Notation and Nomenclature

Waves may be categorized by relative size, or degree. The degree of a wave is determined by its size and position *relative to component, adjacent and encompassing waves*. Elliott named nine degrees of waves, from the smallest discernible on an hourly graph of stock prices to the largest he could assume existed from the data then available. He chose the following terms for these degrees, from largest to smallest: Grand Supercycle, Supercycle, Cycle, Primary, Intermediate, Minor, Minute, Minuette, Subminuette. Cycle waves subdivide into Primary waves that subdivide into Intermediate waves that in turn subdivide into Minor and sub-Minor waves. The specific terminology is not critical to the identification of degrees, although out of habit today's practitioners have become comfortable with Elliott's nomenclature.

When labeling waves on a graph, some scheme is necessary to differentiate the degrees of waves in the stock market's progression. Elliott Wave International has standardized a sequence of labels involving numbers and letters. The following notations, for instance, denote first waves from Grand Supercycle degree down

to Subminuette: Ⓘ, (I), I, ①, (1), 1, ⓘ, (i), i. The most desirable form for a scientist might be 1_1, 1_2, 1_3, 1_4, 1_5, etc., with subscripts denoting degree, but it is difficult to read a large number of such notations on a graph. The above standard provides for rapid visual orientation.

It is important to understand that these names and labels refer to specifically identifiable degrees of waves. By using a nomenclature, an analyst can identify precisely the position of a wave in the overall progression of the market, much as longitude and latitude are used to identify a geographical location. To say, "the Dow Jones Industrial Average is in Minute wave ⓥ of Minor wave 1 of Intermediate wave (3) of Primary wave ⑤ of Cycle wave I of Supercycle wave (V) of the current Grand Supercycle" is to identify a specific point along the progression of market history.

EVIDENCE SUPPORTING THE WAVE PRINCIPLE

Examples of the Basic Pattern From One Extreme of Available Data Duration to the Other

The five-wave pattern is manifest at all degrees of trend. The shortest duration of available data is that which shows every single price change in an index. Such changes are recorded sometimes in less than a second and are called "ticks." Figure 6 shows a "tick" graph from October 6, 1997. Figure 7 shows an hourly graph from September 1997. Figure 8 is a daily graph from 1962. Figure 9 is a weekly graph from 1974-1975. Figure 10 is a monthly graph from the 1930s-1940s. Figure 11 is a yearly graph from 1932 to the present. Figure 12 is a decade-by-decade graph from the 1700s to the present. There is no data prior to 1690. All these plots indicate similar patterns of movement despite a difference in time span of over 30 million to 1. The longer term formulations depicted in Figures 11 and 12 are still unfolding, but to date the pattern is following the same form as on the smaller-degree plots.
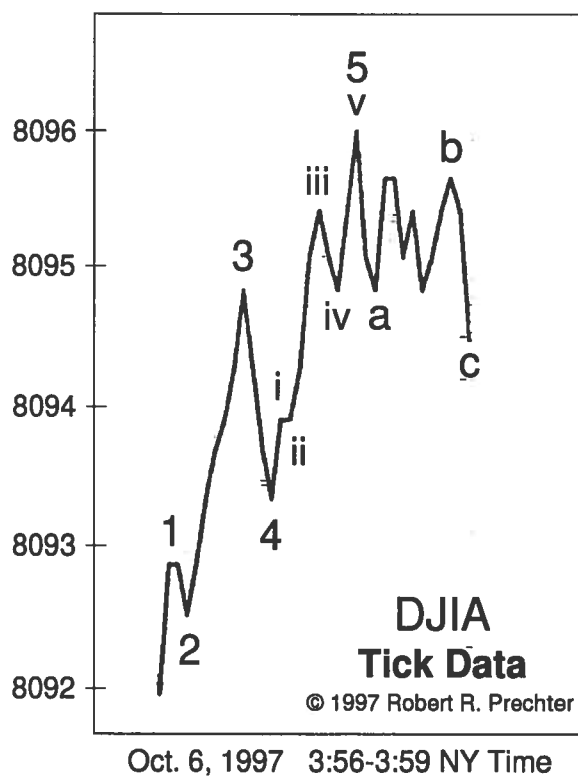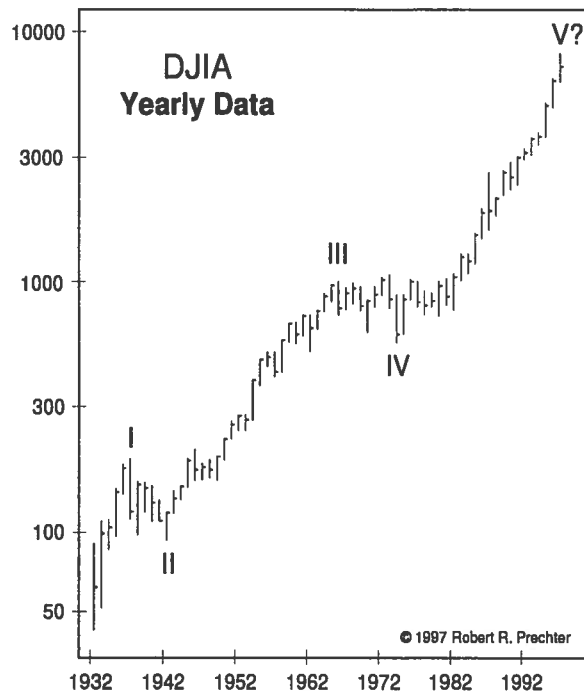

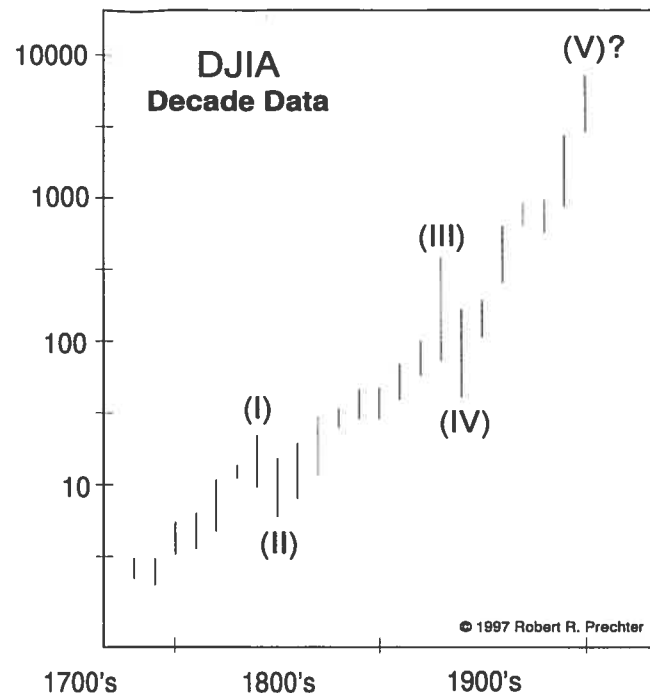Oct. 6, 1997   3:56-3:59 NY Time

Figure 6

Figure 11

Figure 12

A Simple Model Reflects Reality

In 1995, Michael Buettner of Elliott Wave International constructed a simple computer model of the Wave Principle, without considering any actual market behavior. The model consists of the three main rules as well as four guidelines of behavior for the five-wave pattern, as follows:

(1) The second wave does not carry past the beginning of the preceding first wave.

(2) The third wave is not the shortest wave.

(3) The fourth wave does not enter the price range of the first wave.

(4) Wave four usually has a form different from that of wave two. (This model uses a "zigzag" for wave two and a "flat" for wave four, which are their typical positions.)

(5) One motive wave is usually extended, and it is usually wave three. (Wave three is always extended in the model, which arbitrarily makes it equal to .618 times the summed lengths of waves one and five.)

(6) Waves five and one tend toward equality when wave three is extended. (The model makes them equal.)

(7) Waves are often related by Fibonacci ratios. (This model incorporates two common tendencies in having wave two retrace .618 of wave one and wave four retrace .236 of wave three.)

Figure 13 shows the picture created by the computer from this model. Figure 14 shows the same picture to five degrees of iteration. Below it is the actual plot of the Dow Jones Industrial Average from 1932. Understand that Buettner's model excludes numerous important subtleties in the Wave Principle's set of rules and guidelines and forces several rigidities not shared by the actual stock market. Nevertheless, as Buettner concludes, "The market model formulated in the 1930s, even when converted into a highly simplified mathematical idealization, reproduces to a remarkable degree the overall structure of the real market during the subsequent six decades."[3]

Forecasting Success Supports Hypothesis Validity

In *The Elliott Wave Principle — A Critical Appraisal*, Hamilton Bolton made this opening statement:

> As we have advanced through some of the most unpredictable economic climate imaginable, covering depression, major war, and postwar reconstruction and boom, I have noted how well Elliott's Wave Principle has fitted into the facts of life as they have developed.[4]

The twists and turns of the plot of stock prices from 1932 to the present are history now, but before they happened, the path that the DJIA was to take was considered utterly
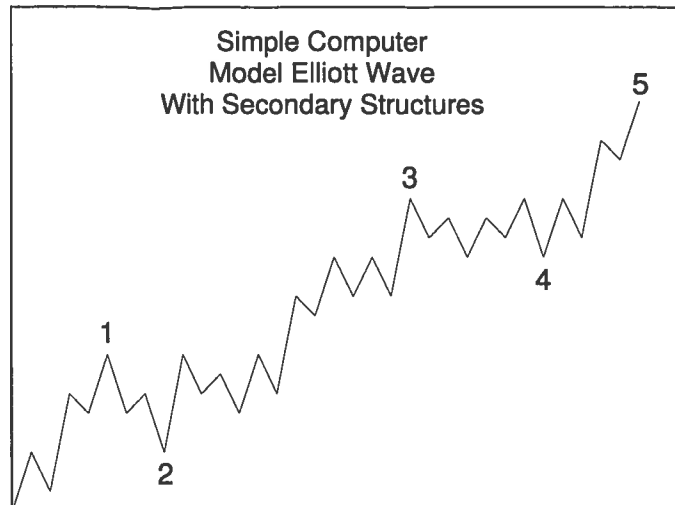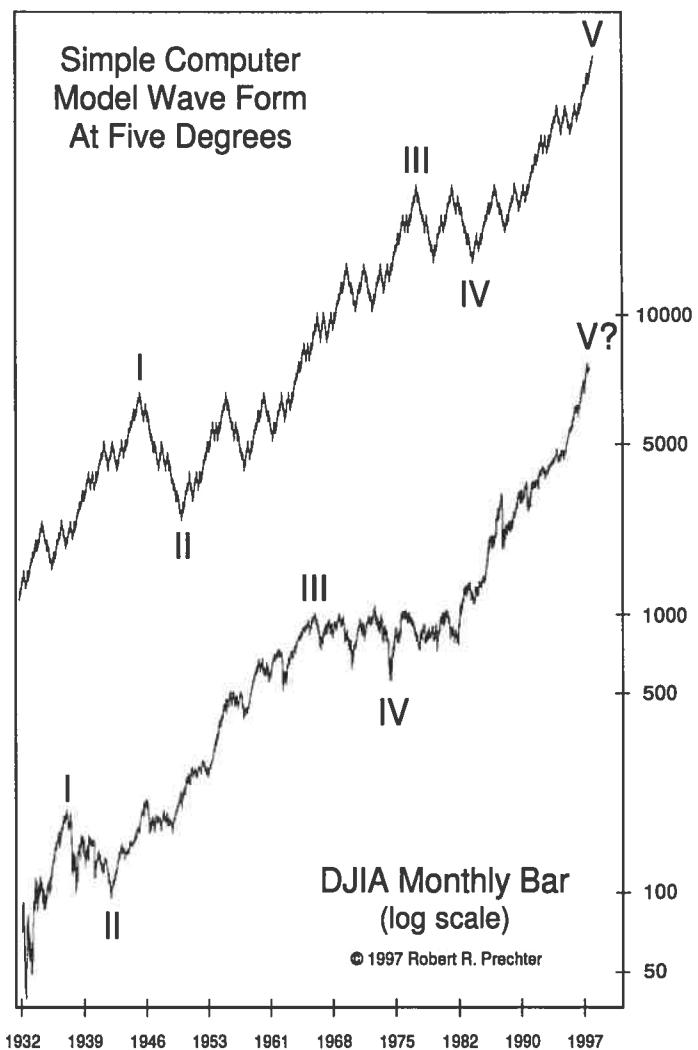

Figure 13

Figure 14

unpredictable. Indeed, it still is. However, five people in succession applied this crude young science to forecasting the market's movement during that time with results that are unprecedented.

As you read the excerpts, notice that each analyst was operating under the assumption of the Wave Principle and therefore consistently maintained the same essential conclusions regarding the wave position of the Dow Jones Industrial Average, namely: (1) 1932 marked the low of a *fourth* wave in a five-wave structure that had begun in the late 1700s. (2) The Dow required a *fifth* wave in that structure. (3) That fifth wave would itself subdivide into five waves of the next lower degree.
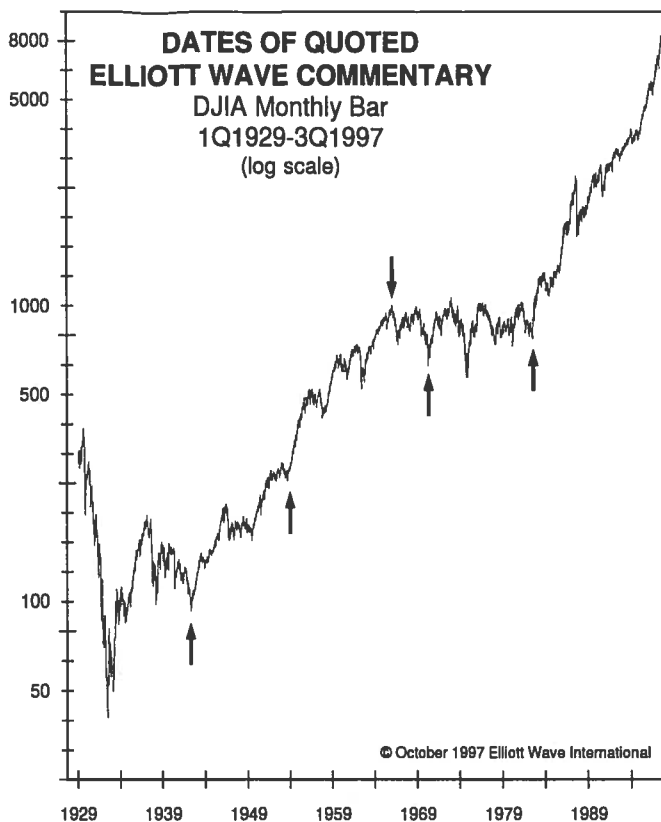

Figure 15

Locate the years 1942, 1954, 1966, 1970 and 1982, which are marked on Figure 15. In each of those years, the foremost proponent of the Wave Principle at the time published the commentary that follows. To get a better feeling for the uncertainty of the outlook at the time, please take a piece of paper and cover the remainder of the graph on each date.

August 11/25, 1941

Ralph Nelson Elliott, recognizing the end of the wave (IV) corrective process (later labeled wave II) and forecasting the entire wave (V) advance:

> The earliest available stock record is the Axe-Houghton Index, dating from 1854. The essential "change" characteristics of the long movement from 1854 to September 1929 are shown in the accompanying graph. The wave from 1857 to 1929 may be either Supercycle wave (I), (III) or (V), depending upon the nature and extent of development of the country before 1854.[2] There is reason to believe, however, that the period from 1857 to 1929 can be regarded as Supercycle wave (III). The market since 1929 has outlined the pattern of a gigantic thirteen-year triangle of such tremendous scope that these defeatist years may well be grouped as Supercycle wave (IV) of an order dating back to as early as 1776. My observation has been that orthodox triangles appear only as the fourth wave of a cycle.
> Nature's inexorable law of proportion accounts for the recurrent 0.618 ratio of swing-by-swing comparison, [as you can see from] the following tabulation of important movements since April 1930:

The Cyclical Relativity of Market Trends							
Wave	**Dates**			**Points**			
No.	From	To	From	To	Change	Ratio	
R	April 1930	July 1932	296.0	40.5	255.5		
S	July 1932	March 1937	40.5	196.0	155.5	155.5/255.5=	60.9%
T	March 1937	March 1938	196.0	97.0	99.0	99.0/155.5=	63.6%
U	March 1938	Sept. 1939	97.0	158.0	61.0	61.0/ 91.0=	61.6%
						Avg.	62.0%

These ratios and series have been controlling and limiting the extent and duration of price trends irrespective of wars, politics, production indices, the supply of money, general purchasing power, and other generally accepted methods of determining stock values. This feature proves that current events and politics have no influence on market movements.

Since the causes of this phenomenal market behavior originate in the relativity of the component cycles compressed within the triangular area, it is distinctly encouraging to be able to point out that the rapidly approaching apex of the triangle should mark the beginning of a relatively long period of increasing activity [i.e., price increase] in the stock market. [See Figure 16.] Triangle wave 5 is well advanced, and its termination, within or without the area of the triangle, should mark the final correction of the 13-year pattern of *defeatism*. This termination will also mark the beginning of a new Supercycle wave (V) (composed of a series of cycles of lesser degree), comparable in many respects with the long [advance] from 1857 to 1929. Supercycle (V) is not expected to culminate until about 2012. (See dashed line in the graph. [Figure 17])[5,6]
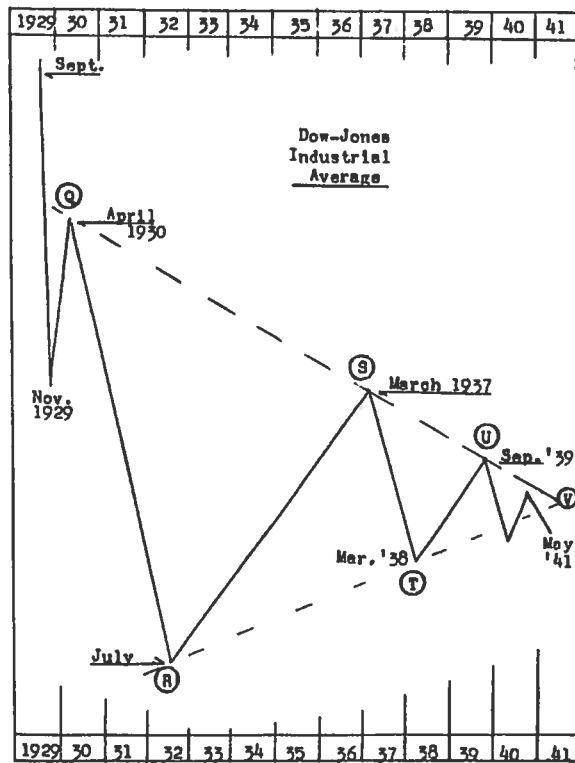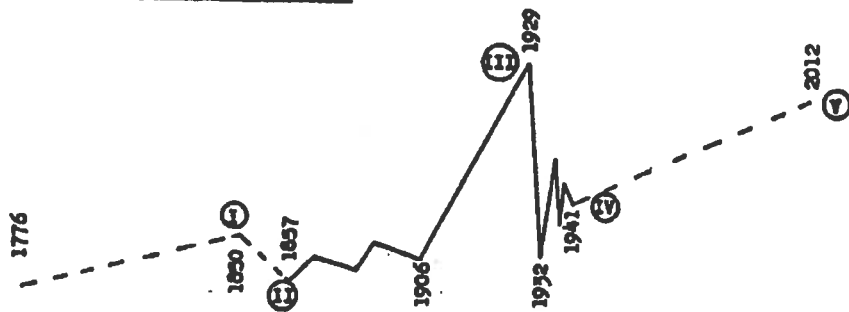

Figure 16

Figure 17

[Note: The DJIA touched its low eight months later in April 1942 during the darkest days of World War II. It has not looked back since.]

First Quarter, 1953

Arthur Hamilton Bolton, recognizing the position, and forecasting the extent, of wave III:

The late R.N. Elliott in 1941 projected a pattern of future stock market behavior which has not varied in fundamentals from his original outline years ago. This last prediction, or hypothesis, is vitally important, because if Elliott is right, we will not see again probably in this century stock prices as low "in dollar price" as they were in 1942. Of course, inflation will take care of a great deal of that hypothesis anyway, but it does mean that **no major depression of the 1929-32 variety is in the cards in our lifetime** (although there may well be 1921s, 1896s, 1873s again within this span). Further, it is as well to keep the background in perspective; Elliott's projection was made at a time when deflation and not inflation was the current fear.

The significance of Elliott's projection should now become more apparent.

(1) Elliott's hypothesis calls for a series of bull markets from 1942 similar in degree to those between 1857 and 1929, in the pattern of 5 waves (3 up and 2 down in between), followed by 3 down (2 down and 1 up), all moving on to successively higher levels.

(2) Wave I of the first Cycle bull market was completed in 1946 (Elliott's analysis [before his] death in 1947), and its correction (wave II) was completed in June 1949.

(3) Because of both the time element (a third wave according to Elliott is never shorter in time than the first wave) and amplitude indicated, we must now still be in wave III of the 1942-? bull market (one Cycle wave).

(4) Following completion of wave III (not likely before 1954 because of time and amplitude elements), there should be a correction (wave IV) on the order of 1946-49, which, however, should not break the base line of the 1942-1949 lows, according to one of Elliott's tenets. (This is a normal expectation only and might in an extreme case be violated slightly.)

(5) Following wave IV, wave V should close out the first upward Cycle from 1942. Because of the time element again, **it looks like the 1960s before we face a correction to the whole rise from 1942 and anything approaching a major depression in stock prices.**[7]

[Note: Bolton's chart forecast (Figure 18), called for a top at Dow 1000 by 1965.]
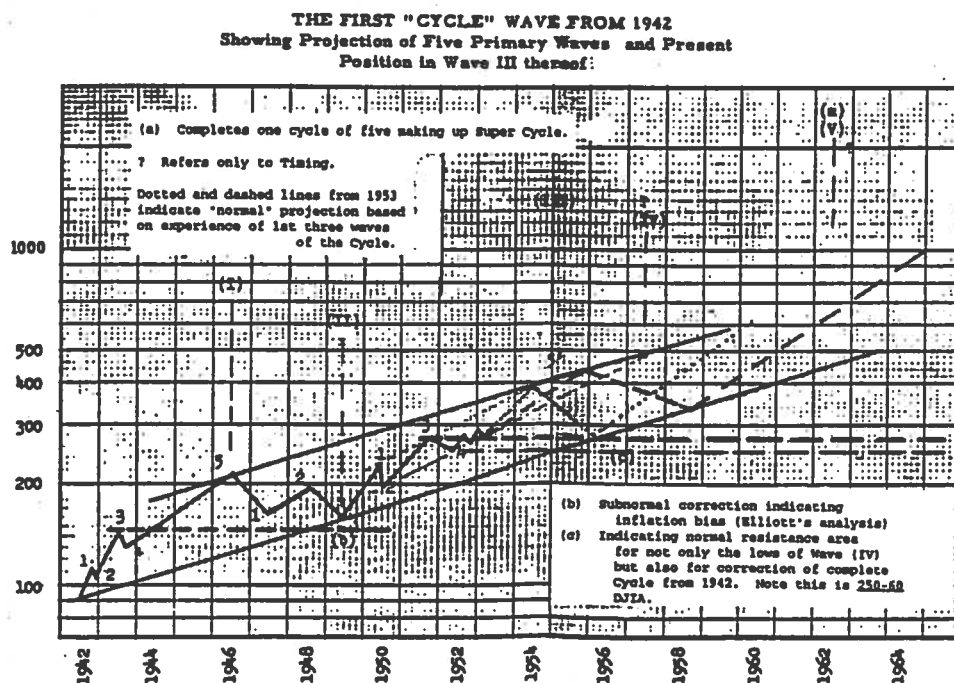

Figure 18

First Quarter, 1960:

Hamilton Bolton, continued:

The ratio of 61.8 to 100 and 100 to 161.8 became a central part of Elliott's theories in regard to both *time* and *amplitude*. Thus, Elliott pointed out a number of other coincidences. For instance, the number of points from 1921 to 1926 (i.e., the first three waves) was 61.8% of the number of points of the last wave from 1926 to 1928 (the orthodox top). Likewise in the five waves up from

Figure 19

1932 to 1937. Again, the wave from the top in 1930 (297 DJIA) to the bottom in 1932 (40 DJIA) is 1.618 times the wave from 40 to 195 (1932 to 1937). Also, the decline from 1937 to 1938 was 61.8% of the advance from 1932-37 in DJIA points. Should the 1949 market to date adhere to this formula, then the advance from 1949 to 1956 (361 points in the DJIA) should be complete when 583 points (161.8% of the 361 points) have been added to the 1957 low of 416, or a total of **999 DJIA**. [See Figure 19.][4]
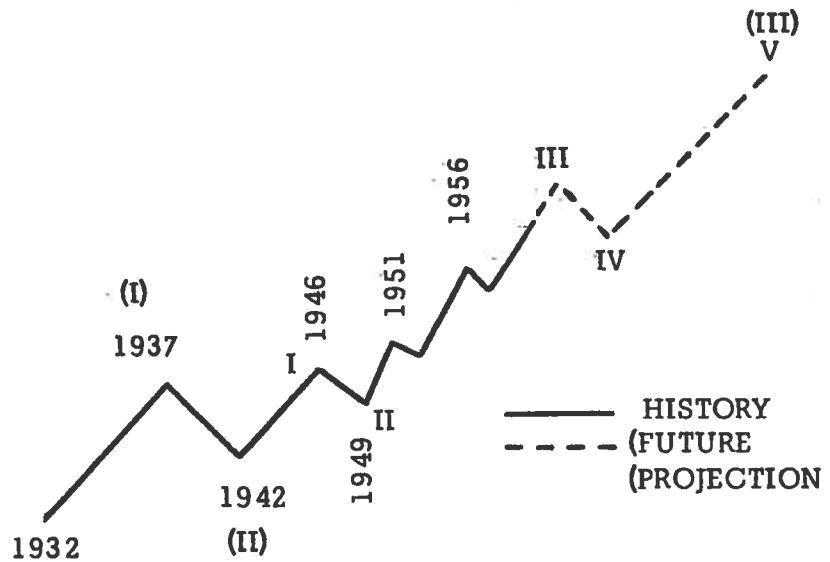
[Note: the daily closing high for the Dow in February 1966, 13 years after the first quotation and six years after the second, was **995.14**. From that point, the stock market experienced its largest drop since 1937-1942.]

First Quarter, 1966

Charles Joseph Collins, identifying the end of wave III and forecasting the extent of wave IV:

In the count of Supercycle wave 5 from 1932, I find, as shown above, that two Cycle waves have been completed and a third may have completed in January 1966 or, if not (see subsequent discussion), then it is in the process of completion.[3] These Cycle waves are illustrated in [Figure 20].

Cycle wave (III), beginning 1942, which is the wave of current interest, I break down as shown in [Figure 21]. Incidentally, the upward slant of Primary wave IV between 1956 and 1962 carries inflationary implications.

Primary wave V (1962-1966?) of Cycle wave (III) is shown in [Figure 22] by giving the monthly swings of the Dow Industrials. Since Intermediate wave 3 of this Primary wave extended, **it would appear that Intermediate wave 5, and thus Primary wave V as well as Cycle wave (III), ended in January 1966,** as the market has subsequently developed a downthrust. Those who might argue that such a downswing constitutes wave 2 of an extension of wave 5 are faced with Elliott's dictum that an extension can occur in any one of
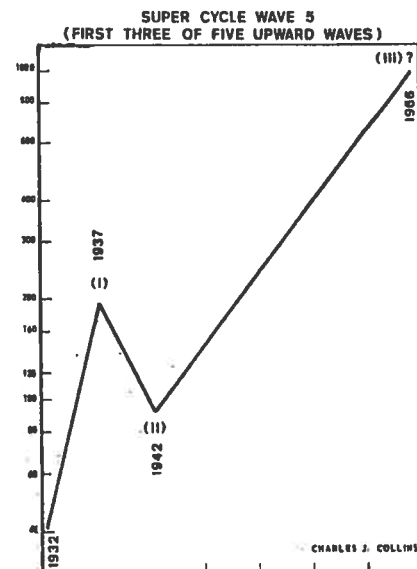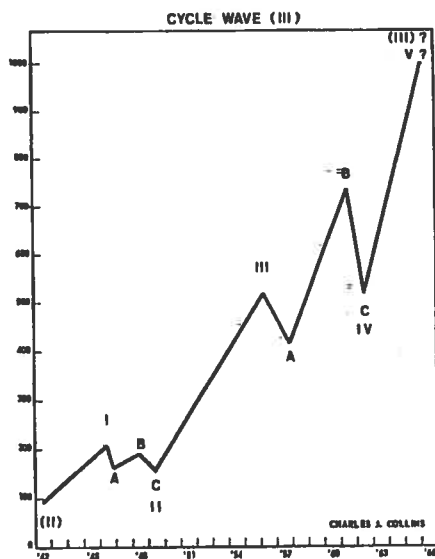

Figure 20

CYCLE WAVE (III)

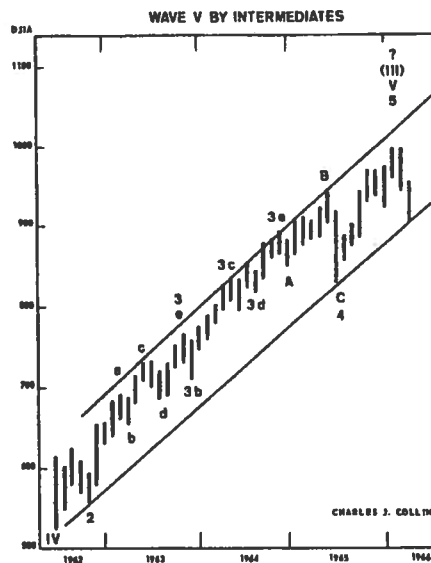*Figure 21*

WAVE V BY INTERMEDIATES

Figure 22

waves 1, 3 or 5, but never in more than one. The extension in Intermediate wave 3, under Elliott's rule, would thus preclude an extension in Intermediate wave 5.

The third wave of Primary wave V extended, and Elliott states that an extension will be retraced twice. Such being the case, this would call for the "C" wave of Cycle wave (IV) to carry back at least to 770-710 on the Dow, in other words, to the approximate area within which the extension of Intermediate wave 3 began (see points 3 and 3b of [Figure 22]). The decline could carry further, however, under Elliott's rule that the correction of a wave should normally carry back to around the terminal point of the fourth wave of the five lesser waves that characterized the swing. The terminal point of the fourth Primary wave of Cycle wave (III) (see [Figure 21]) was established in 1962 at 524 on the Dow. **Purely as a speculation, might not the "A" wave of Cycle wave (IV) carry to the 770-710 area, the "C" wave to around the lower 524 point, with a sizable intervening "B" wave?**[8]

[Note: the 1966 daily closing low was **744.31**, and the 1974 low was **577.60**.]

May 1970

Alfred John Frost, forecasting the low of wave IV:

A. Hamilton Bolton in May 1960 said, "Should the 1949 market to date adhere to the Fibonacci formula, then the advance from 1949 to 1956 (361 points in the DJIA) should be complete when 583 points (161.8% of the 361 points) have been added to the 1957 low of 416, or to a total of 999 DJIA." This forecast was made almost six years before the great bull market peaked at approximately 1000 DJIA. Applying the same formula to determine the extent of the current bear market, we get a number of possibilities, each indicating that a severe market lies directly ahead. A drop of 61.8% from the recorded high of 1000 DJIA would bring the Dow back to 381, its 1929 high. This doesn't seem probable, [as] the current Cycle wave from 1966 should not overlap the 1929 high. Should the current C-wave from December 2, 1968 (DJIA 986) drop 414 points (161.8% of the 1966 A-wave decline of 256 points), **the market would bottom out at 572.** [See Figure 23.][9]

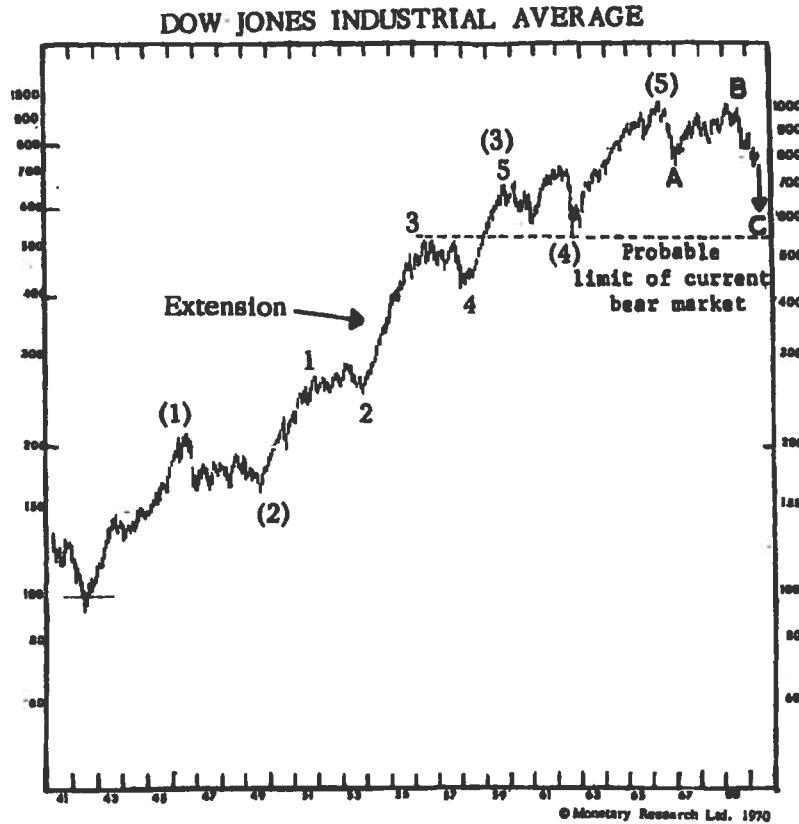[Note: the hourly low of the bear market occurred on December 9, 1974 at **572.20**.]

DOW JONES INDUSTRIAL AVERAGE

Figure 23

September 13, 1982

Robert Rougelot Prechter, Jr., identifying the onset of wave V and projecting its substantial extent:

This is a thrilling juncture for a wave analyst. For the first time since 1974, some incredibly large wave patterns may have been completed, patterns that have important implications for the next five to eight years. The technical name for wave IV by this count is a "double three," with the second "three" an ascending triangle. [See Figure 23] **This wave count argues that the Cycle wave IV correction from 1966 ended last month (August 1982).** The lower boundary of the trend channel from 1942 was broken briefly at the termination of this pattern. A brief break of the long term trendline, I should note, was recognized as an occasional trait of fourth waves, as shown in *R.N. Elliott's Masterworks.*[1]
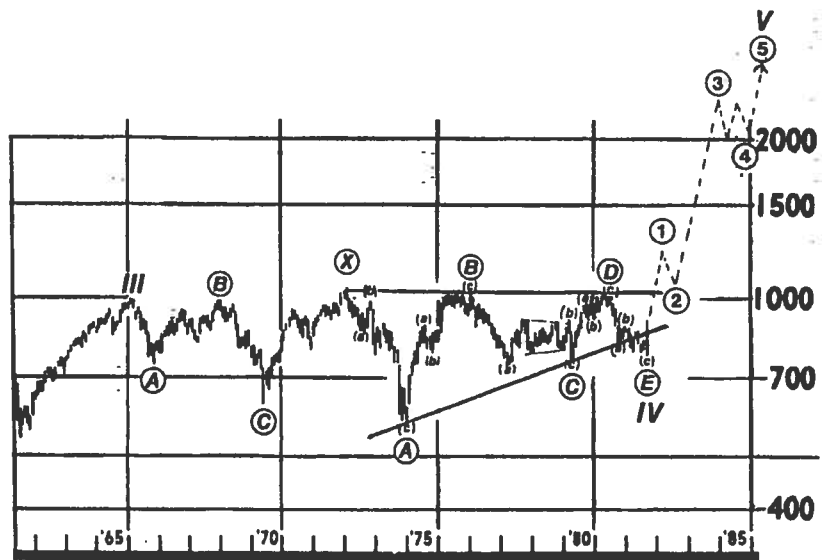

Figure 24

The task of wave analysis often requires stepping back and taking a look at the big picture and using the evidence of the historical patterns to judge the onset of a major change in trend. Cycle and Supercycle waves move in wide price bands and truly are the most important structures to take into account. [They indicate that] **a period of economic stability and soaring stock prices has just begun**. One must conclude that a bull market beginning in August 1982 would ultimately carry out its full potential of **five times its starting point**.[10]

[Note: As "bears" called for a drop to Dow 300-500 and "bulls" debated whether a large rise would stop at 1100 or 1200, Prechter identified the end of a 16-year sideways trend a month after its end at Dow 777 and projected a climb to nearly 4000 on the Dow.]

April 6, 1983

Robert Prechter, continued:

What might we conclude about the psychological aspects of wave V? As the last hurrah, **it should be characterized, at its end, by an almost unbelievable institutional mania for stocks and a public mania for stock index futures**, stock options, and options on futures. In my opinion, the long term sentiment gauges will give off major trend sell signals two or three years before the final top, and the market will just keep on going. In order for the Dow to reach the heights expected by the year 1987 or 1990, *and* in order to set up the U.S. stock market to experience the greatest crash in its history, which, according to the Wave Principle, is due to follow wave V, **investor mass psychology should reach manic proportions, with elements of 1929, 1968 and 1973 all operating together and, at the end, to an even greater extreme**.[11]

[Note: Propelled by an unprecedented public and institutional interest and participation, average U.S. share valuation today (October 1997) with respect to dividend yield and corporate book value is the highest in 300 years of Western stock market history by a substantial margin.]

Summary

Unfortunately, market forecasting has not yet been conducted as a scientific experiment, so there is insufficient data to prove the value of these forecasts. Each of the practitioner cited above made errors as well, an experience that is shared by everyone who attempts to forecast market prices. The three points that matter with respect to the above quotations are as follows: (1) No other approach to market forecasting has allowed anyone even to adopt a perspective such as these forecasts reflect. (2) No approach to market forecasting has produced a degree of success remotely approaching that cited above. (3) The outlook through these practitioner has been *consistent* throughout this sixty-year period, as *each practitioner held the same view of the ultimate path for prices and followed through accordingly.*

THE FRACTAL AND SPIRAL DESIGN OF SOCIAL PROGRESS

The Wave Principle reveals that aggregate stock price movement is intricately patterned. Because the market is so patterned, there must be a primary cause of its behavior, a force that shapes it. Those who study the market note that sometimes it appears to react to outside conditions and events, but most of the time, it is entirely detached from what most people assume are causal conditions. Unless one wishes to argue that presumably causal events and conditions are themselves patterned to produce the Wave Principle, there must be another cause. For reasons to be explored in the oral presentation, the primary mover of aggregate stock market prices appears to be mass emotional change, which itself must be, and apparently is, independent of outside influence. Social mood and changes in it, then, probably reflect the workings of human nature as a social animal. The determinants of the specifics of market action are the naturally occurring direction, speed and extent of social mood changes.

Social mood change need not necessarily involve every individual, but in the aggregate, the people participating in markets are acting as a herd. Gustave Le Bon, a pioneer in the study of crowd psychology, proposed a "law of the mental unity of crowds," whereby individuals cease to think independently and instead participate unconsciously in "a sort of collective mind."[12] "Wall Street" certainly shares aspects of a crowd. Every day, investors watch the same ticker tape, read the same newspapers, listen to the same financial television shows and watch the same market indices go up and down. The same information, opinion and emotional expression is absorbed and reflected by millions of people involved in the market. It is almost as if the participants are in a town square, and an orator trying to whip up revolution is standing on a balcony, making the crowd's emotions wax and wane with each change in content, tone and volume. In the case of markets, however, the orator and crowd are typically one and the same. Much of Wall Street's information, such as price level, direction, speed of price change and volume, is self-generated, and just like a mob, the financial community feeds off its own emotions. The reason is that every market decision is both *produced by* information and *produces* information. Each transaction, while at once an *effect*, becomes part of the market and, by communicating transactional data to investors, joins the chain of *causes* of others' behavior. This feedback loop is apparently governed by man's unconscious social nature (also to be explored in the oral presentation), and since he *has* such a nature, the process generates forms. As the forms are repetitive, they have predictive value.

This process clearly involves the feedback of result back into the system as new cause, making it a prime candidate for study under chaos theory. The limited non-quantitative definitions of waves allow for immense

variability of result, which is abundantly evident in stock market reality, just as it is in all chaotic processes.

The science of fractal geometry reveals that much of nature is made up of the kind of patterns and relationships that Elliott recognized and described.[13] The modern pioneer in the concept is Benoit Mandelbrot, a former professor at Harvard, Yale and the Einstein College of Medicine, who documented his discovery that many natural forms that scientists had assumed were random are not. Observers had presumed that no specific geometry governed clouds, seacoasts, mountain ranges, cotton prices or trees. Mandelbrot said that isn't true; they display a relational form that scientists had not considered, an orderliness that comes from the fact that they possess *self similarity on different scales*.[14]

This description echoes Elliott's observation that the stock market traces out *the same characteristic patterns at all degrees of trend*, producing self similarity on different scales. Daily, hourly and shorter term graphs all show the same patterns as do longer term graphs. This excerpt from a 1987 article in *The New York Times* summarizing Mandelbrot's ideas brings us closer to the point:

> When you zoom in, looking closer and closer, the irregularities don't smooth out. Rather, they tend to look exactly as irregular as before. Some of Mandelbrot's fractal patterns looked indistinguishable from records of stock market prices. Economists needed to understand the heretical idea that prices don't change in a smooth, continuous flow. [Ed. note: Why an idea that reflects reality may be labeled "heretical" is a question only for academia, not for those who deal intimately with markets.] They can change abruptly in instantaneous jumps.[15]

Similarly, Elliott recognized that big bear markets are no different in basic shape from short term reactions. They are just of a larger scale and thus occur less often. They do not, however, occur less often *relative to the size of advances that precede them*. A headline-making market "crash," for instance, is merely a large version of what happens all the time on smaller scales.

The article continues, "The same question applies to economics. Daily fluctuations are treated [by economists] one way, while the great changes that bring prosperity or depression are thought to belong to a different order of things. In each case, Mandelbrot said, my attitude is: Let's see what's different from the point of view of geometry. What comes out all seems to fall on a continuum; the mechanisms don't seem to be different." This is precisely R.N. Elliott's observation about stock market.

Figure 25 brings us closer to another one of Elliott's revolutionary observations. It shows a computer-generated snowflake. In this example, the whole is not simply as irregular as its parts; it is the *same pattern* as its parts, from the largest size component to the next and the next. As observations continue at smaller or larger degrees, one forever finds the same shape. Figure 26 shows a computer-generated broccoli floret.
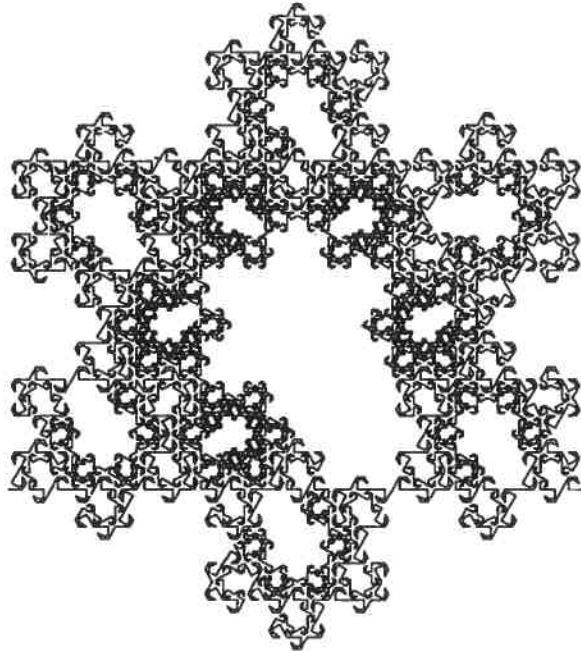
Snowflake

Figure 25
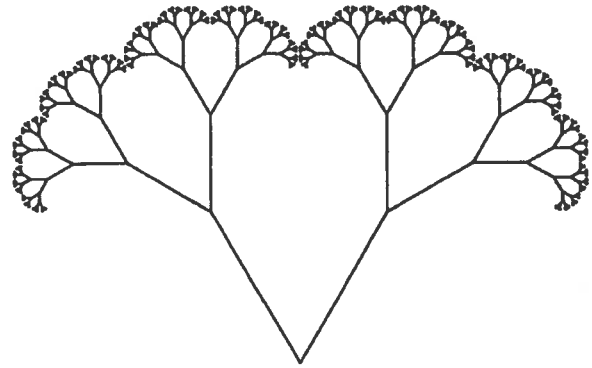
Broccoli

Figure 26

Notice that when you observe the smaller degrees, it continues to be the same picture, just like the snowflake. Figure 27, created according to a simple formula employing a fractal dimension, produces the same form at different degrees as well, and reflects what R.N. Elliott said happens in the stock market. As in Figures 25, 26 and 27, the smaller advancing and declining patterns depicted earlier in Figure 4 not only display *discontinuity* (i.e., relative size and frequency of internal trend reversals) comparable to that of the larger patterns, *but they form component replicas of them*. The entire structure is based on one simple form. Thus, although Elliott came to his conclusions fifty years before the new science of fractals blossomed, he
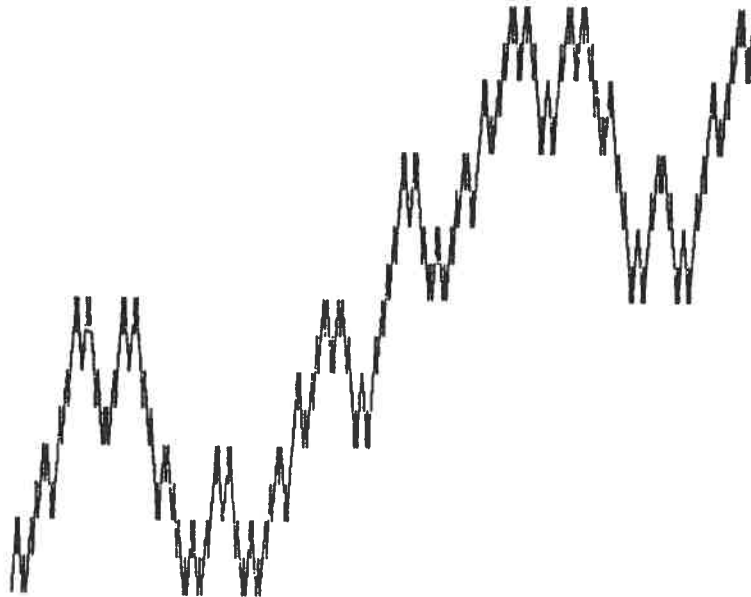

Figure 27

went a great step further than current observers of natural processes. He explained not only that the progress of the market was fractal in nature, *but discovered and described the component patterns*.

The Spiral Growth Form

While Euclidean geometric forms (except perhaps for the ellipse) typically imply stasis, a spiral implies motion: growth and decay, expansion and contraction, progress and regress. The logarithmic spiral is the quintessential expression of natural growth phenomena found throughout the universe and is reflected in structures as diverse as pine cones, sunflowers, sea shells, whirlpools and hurricanes. It covers scales as small as the motion of atomic particles and as large as galaxies. The idealized Elliott concept of the
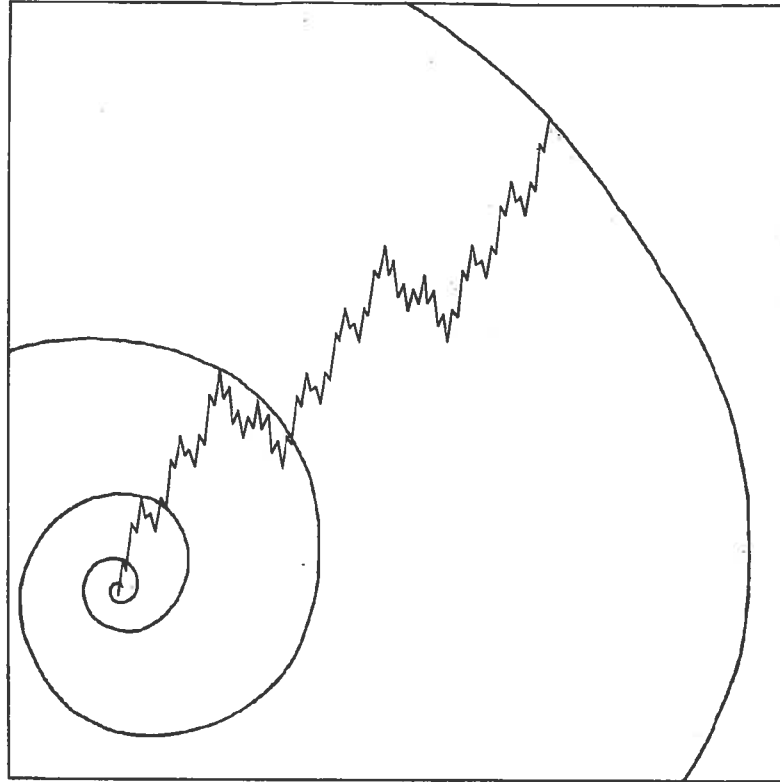

Figure 28

progression of the stock market, as presented in Figure 4, is an excellent base from which to construct a logarithmic spiral, as Figure 28 illustrates with a rough approximation. In this construction, the top of each successive wave of higher degree is the touch point of the logarithmic expansion. The further time extends, the larger the degrees of trend get, implying a geometric expansion in the size of the advances and retrenchments that form mankind's progress. Both logarithmic spirals and the Fibonacci ratio are linked in their association with natural patterns of growth.[4] The fact that both of these phenomena are linked to man's collective emotions suggests that they are involved in shaping the progress of cultures, if not of the species.

In its broadest sense, the Wave Principle suggests the idea that the same law that shapes living creatures and galaxies is inherent in the spirit and activities of men *en masse*. Because the stock market is the most meticulously tabulated reflector of mass psychology in the world, its data produce an excellent recording of man's social psychological states and trends. Those states and trends in turn produce a fluctuating self-evaluation of social man's productive enterprise. The oral presentation will argue that these mass psychological fluctuations are not only correlated with mankind's actual progress and regress through history, but in fact produce them. What the Wave Principle ultimately says, then, is that mankind's progress, which results from his social nature, does not occur in a straight line, does not occur randomly, and does not occur cyclically.

Rather, progress takes place in a "three steps forward, two steps back" fashion, a form that nature prefers. More grandly, as the activity of social man can be linked to the Fibonacci sequence and spiral patterns of progression, it is apparently no exception to the general law of order in the universe.

CONCLUDING REMARKS

R.N. Elliott's discovery of the Wave Principle sixty years ago was a major breakthrough in sociology. To summarize Elliott's achievements, he discovered that the market displays fractal geometry, he discovered and described the component patterns and how they link together, he recognized the mathematical basis of the patterns, and he concluded from all this evidence that human social behavior regulates itself according to one of the most ubiquitous laws of natural growth. Because crowds have a nature all their own and a behavioral style that reflects it, mass emotional change has a fair degree of predictability, which means that for the first time ever, rudimentary social forecasting is possible. Subsequent testing and application of the Wave Principle, cursory though it has been, has lent credibility to the basis hypothesis.

We now have a unifying model of social behavior that can be tested. If it proves true, social science will be profoundly and irrevocably shaped by the simple yet profound concept that on the whole, mankind's progress through history, propelled by the natural ebb and flow of social mood, follows a grand fractal and spiral design governed by the Fibonacci ratio, the same ratio that governs patterns of growth and expansion found throughout the universe.

Further Questions To Be Addressed

What might be the biological origins of this pattern of social behavior?

What human characteristics and attributes do waves reflect?

Is there a connection between social mood and history, and if so, what is the direction of causality?

What aspects of history relate to the trends of social mood?

Are there outside forces that can affect the pattern?

How far back in history does the pattern extend?

Is the pattern limited only to human progress?

Where is history now in the fractal pattern, and what are its implications?

Mr. Prechter will address these questions in his oral presentation, "The Relationship of Mathematics to History."

NOTES

[1] **Summary of Additional Technical Aspects**: Additional technical aspects of waves, which are discussed in detail in *Elliott Wave Principle*, are herewith stated as briefly as possible: Impulses, i.e., five-wave patterns like those shown in Figures 1 through 4, are typically bound by parallel lines. One wave in an impulse, i.e., 1, 3 *or* 5, is typically extended, i.e., much longer than the other two. There are two rare motive variations called diagonal triangles, which are wedge-shaped patterns that appear in one case only at the start (wave 1 or A) and in the other case only at the end (wave 5 or C) of a larger wave. Corrective waves have numerous variations. The main ones are named zigzag (which is the one shown in Figures 2, 3 and 4), flat, and triangle (whose labels include D and E). These three simple corrective patterns can string together to form more complex corrections (the components of which are labeled W, X, Y and Z). In impulses, waves 2 and 4 nearly always alternate in form, where one correction is typically of the zigzag family and the other is not. Corrections usually terminate within the span of wave 4 of the preceding impulse. Each wave exhibits characteristic volume behavior and a "personality" in terms of attendant momentum and investor sentiment.

[2] Elliott called them "Cycle" waves in the early days of his nomenclature.

[3] Collins originally used one-degree higher terminology but meant the same waves as other practicioners

[4] While Fibonacci numbers have theoretic weight in the grand concept of the Wave Principle, it is the *ratio* that is the fundamental key to growth patterns of this type. The Fibonacci ratio results from this type of additive sequence no matter what two numbers start the sequence. The Fibonacci sequence is the basic additive sequence of its type since it begins with the number "1" (see Figure 29), which is the starting point of mathematical growth. However, we may also take any two *randomly selected numbers*, such as 17 and 352, and add them to produce a third, con-tinuing in that manner to produce additional numbers. As this sequence progresses, the ratio between adjacent terms in the sequence always approaches
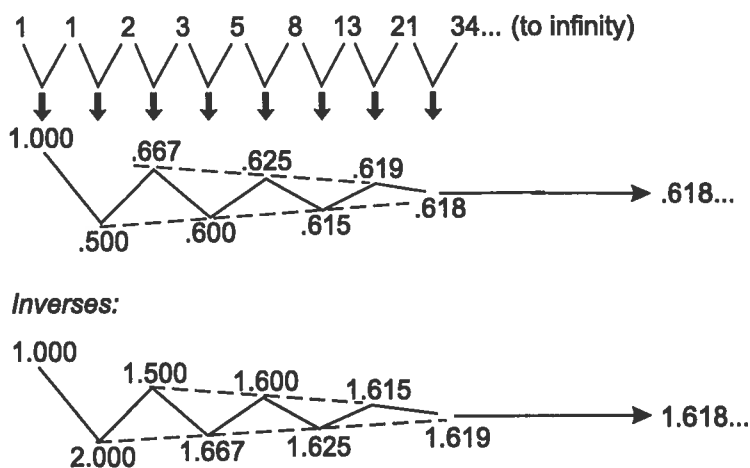
Figure 29

the limit *phi* very quickly. This relationship becomes obvious by the time the eighth term is produced (see Figure 30). Thus, while the specific numbers making up the Fibonacci sequence reflect the ideal progression of waves in markets, the Fibonacci *ratio* is a fundamental law of geometric progression in which two preceding units are summed to create the next.
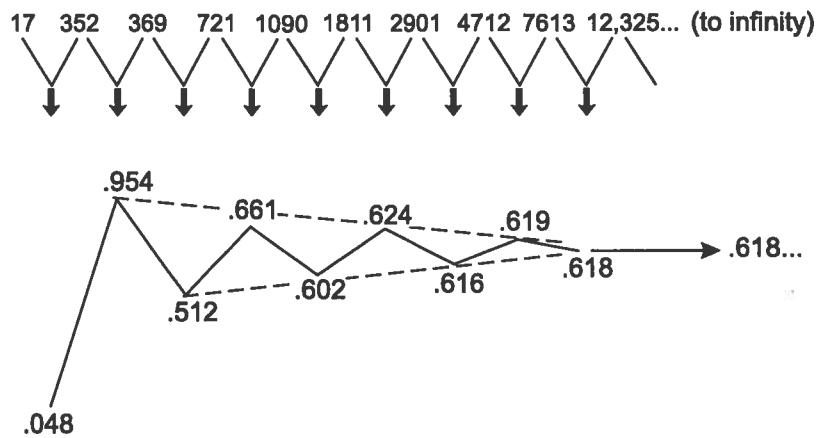
17   352   369   721   1090 1811 2901 4712 7613 12,325... (to infinity)

.954

.661 — — — .624 — — — .619 — — — .618...

.048

.512   .602   .616   .618

Figure 30

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