F O R E C A S T I N G

THE NEW YORK STOCK MARKET

Being a Treatise on the

Geometrical or Chart System of Forecasting
In Which is Explained the Principles of the
Art, and, in this Lesson No. 1, Giving
a Demonstration With the Price
Curve of Potatoes in U. S.

By Prof. Weston
Washington, D. C. 1921

The New York Stock Exchange was first incorporated on May 17, 1792, 8:52 a.m., at New York City, as an association of stock brokers. In 1817 the plan of association was remodeled and a set of new rules adopted. On February 21, 1820, the code of rules was revised and a reorganization was established which has not been greatly changed up to the present time. By the year 1858 the volume of business had attained important proportions and the daily trading was fairly continuous for the most active issues. From 1873 to present date the New York Stook Market records may be oonsidered as fairly reflecting the general business condition of the country, and from that year onward are to be taken as truly representative of the changes in values in the world of finance and speculation.

The real record, of course, embraces the transactions in a large number of issue, but for practical use the prices of 20 railroad stocks and 10 industrials have been averaged, daily, for a number of years. These are available at this time (1921) for more than fifty years. These averages are generally of the closing bid on the several issues and constitute a series of daily values which we call the stock market record, or trend.

There is usually a distinction made between the railroad stocks averages and the averages of the industrials, but in reality they move just about the same. However, in this work the railroad stocks averages are taken, as best representing the movement over a considerable term of years.

This record of average prices is usually represented in terms of dollars and cents, that is, the values are carried to the second place of deoimals of the dollar. When charted according to the usual and conventional mode of charting all such trends, a geometrical curve is the result, that is to say, the charted values of the New York Stock Market price record have the appearance of an irregular "curve," as expressed in the language of that art which deals largely with "curves," namely, geometry.

On account of special references that are to be made in this thesis regarding geometrical curves it may be well here to remark that in mathematices all lines are "curves," with the single exception of straight lines. But since it is practically impossible to draw a straight line of any appreciable length, then in actual demonstration no appreciable lines but curved lines can exist.

This is equivalent to saying that any graphic representation by linear plotting must always be a "curve." As a consequence, then, of the definition of this scientific term, the Stock Market trend as of record may justly be called a "curve," indeed, it is a geometrical curve, the same as any other linear representation.

But the Stock Market trend is the representing curve of a natural phenomena, the phenomena of alternately rising and lowering prices on important properties distributed throughout the country. This statement that price change on properties is natural phenomena may seem questionable to many readers, but a careful study of the subject has fully shown the facts to be fairly clear and well substantiated. Statisticians generally recognize phenomena in these changes, because it is quite obvious that the problem really involves fundamental considerations that can only be treated as natural phenomena.

If no other thing were known about the Stock market but its trend we should be compelled to suspect this movement as being a natural phenomena upon the mere grounds of its universal character. How can a world-wide action take place daily for half a century or more without taking on all the characteristics of a genuine natural phenomena? Many thousands of absolutely independent traders make numerous commitments each day on this market and it would obviously be the height of absurdity to suppose that they act by deliberative convention, in unison, or by organic function. The influence of a few pools is always off-set by others having an opposition interest, so that their action is equal to nothing in the way of bringing on irregularity. As a matter of fact it has been shown time after time that nearly every stock market pool or combine fails in attaining any desired end. So well known is this fact that only in rare instances and under some specially favorable circumstances are pools operated even in a single stock. It is not practical, and of late years is rarely attempted.

The few pools that really do operate never make the smallest attempt at irregularity, simply because that would be instantly checked, to their detriment. They work a few small, common schemes of questionable utility and wind up about where they started.

Legislative tinkering and the wabble produced by the political tricksters are sometimes disturbing factors, but they are generally transitory, and as they occur at intervals only, they may be neglected without much error.

The banking organization has an influence, but so far it has been distributed over long periods of time in such a gradual way that its equation can not well be added in, although it is fairly clear that at times this factor can produce a notable irregularity.

Within the last century it has been shown by several authors that nearly all natural phenomena known to mankind on this earth passes through well defined cycles of change in its duration of manifestation. These cycles, proven to be essential qualities inherent in the character of all phenomena of nature, were shown by Fourier and demonstrated by Schuster, to be made up of a series of harmonic curves, or waves. For example, the tides are computed by a sequence of harmonic values. That is, wave motion and tidal motion in water is governed by a law called the law of gravitation in such a way that the liquid moves along no other lines but those represented by the natural sines, as tabulated in works on geometry. The mathematicians express the case in a form that they call an "equation," and when several components are to be taken account of they write several equations in a certain form called a "sequence." Wherever the geometrical sines are used as an important part of such equations and sequences the writers now call the expression a "Fourier sequence," because Fourier, a French mathematician of the last century, wrote up an exhaustive study of this form of expression. All late authorities, I believe, now concede that the Fourier sequences are of prime value wherever any subject may be mathematically treated as a natural phenomena. That is, it is now understood in science that the sine sequences are the true mathematical fundamentals wherever any natural phenomena of a cyclical character may be represented algebraically. The nature of these sequences is largely treated upon by numerous works on mathematics, and to these the reader is referred for further information on the subject, but just here it may not be out of place to give the following example of the common algebraical form of expression a Fourier sequence:

$y = \cos(at + A) + B\cos(bt + B) + C\cos(ct + C)\ldots$

This general form will be used throughout these lessons, but usually the numerical values will be substituted for some of the symbolical letters, thus rendering the sense more complete.

Now, since the Stock Market curve is a natural and a cyclical phenomena, it may, as a consequence, be resolved into an algebraical series, or sequence of harmonics, and the algebraical expression for this sequence of harmonics would evidently become the equation of the stock market trend for any and all dates.

Note this statement with some care, as it is the fundamental doctrine upon which our system is based. We resolve the records of the past into a series of harmonics and then, by carrying the series into future dates, forecast the market curve. The foundation of the whole system may be briefly stated as follows:

The plotted record of the New York Stock Market is a geometrical curve that represents the manifestation of natural phenomena. When subjected to the harmonic analysis this curve yields a sequence of harmonic components that may be used for purposes of solving the trend, to a close approximation, for future dates.

The problem presents absolutely no difficulties beyond the common labor and pains inseparable from all calculations of the kind. We have nothing to do but merely analyze the market's curve of experience as we have it on record, thus taking out its harmonic components, fix their epochs and ranges, the same as is done with any kind of an experience curve, after which the conventional algebraical expressions for their equations are written, in the usual way, and we are then ready for market forecasting. Solve the equations for future dates and the thing is done.

To proceed in orderly fashion along these lines, observing always strict mathematical and scientific methods, it will, perhaps, be well for the student to first secure a fair understanding of the kind of mathematical reasoning we shall be required to use in this work.

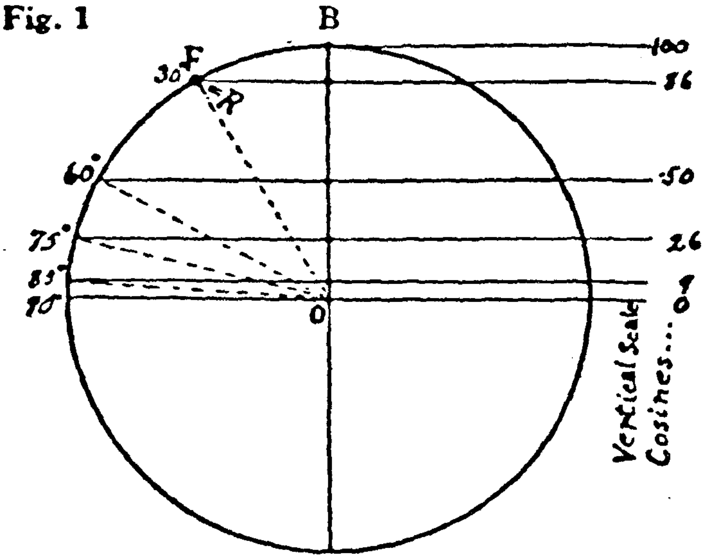
It may be premised, at the beginning, that a cycle connotes, always, a duration time, because there cannot be a real cycle that is not recurrent at regular intervals of time. It is a series of recurring events, in time, but it is, also a series in a certain or fixed length of time.

This definition of course at once gives us the geometrical grounds for the graphic representation. It is the similitude of a circle. It goes all around once and then exactly repeats, time after time, forever. But for the sake of rendering the numerous repetitions available for diagraming purposes and also for utility in adding together the various cycles, the geometrical scholars and authors have conveniently chosen a handy device for transforming the time and range of the natural circle into the natural sine curves. This device is called the equation of the natural sines, and algebraically it is expressed as:

$$y = \cos x$$

This is merely and simply the linear equation of the circle, as may be seen from the following:

Fig. 1



We take a circle and draw in the vertical diameter. The letter O will represent the center and R is a moving point on the periphery of the circle. The motion of R is uniform, that is, as a radius vector it describes equal areas in equal times, but the arc described, if referred to a vertical scale, consequently differs proportionally in units of time. Suppose we begin measuring arcs of the circle at B as an initial or epoch point, that is, a point having the algebraical value of O, and suppose our mover, R, begins a chosen motion at F, then it is plain that the angle BOF will represent the angle of the time from epoch when R is at that position. If R goes on completely around the circle it is also clear that the diameter of the circle will become the measure of the amplitude of oscillation, and the time of once going around becomes the periodic time, or the length of the cycle in units of time. The ratio of BR to the circumference of the circle, taken at any time, becomes the phase of the motion for the time. If degrees are counted on the verticle diameter, always level with R, then those degrees become units of motion exactly in the same ratio to the angle of motion as the natural sines are to the orbit of motion.

It is the common practice in geometry to refer angular motion and time to a linear representation, or diagram, for the sake of the much greater facility for study afforded by such a device. This is easily accomplished by the use of the cosines, which are the equivalent of the angular time units. This fact is well known in Geometry and is clearly illustrated by the foregoing diagram (Fig. 1). This angular motion may be expressed algebraically by the simple equation--

$$y = \cos x$$

Or, we may be a little more elaborate and put--

$$y = \cos x\ (nt + e)$$

Where y is the graphic abscissa and the angular value in time, x is the graphic ordinate and the radius of the circle in terms of the natural sines, while n is the unit angle that R describes in time, t, and e is the epoch, or date.

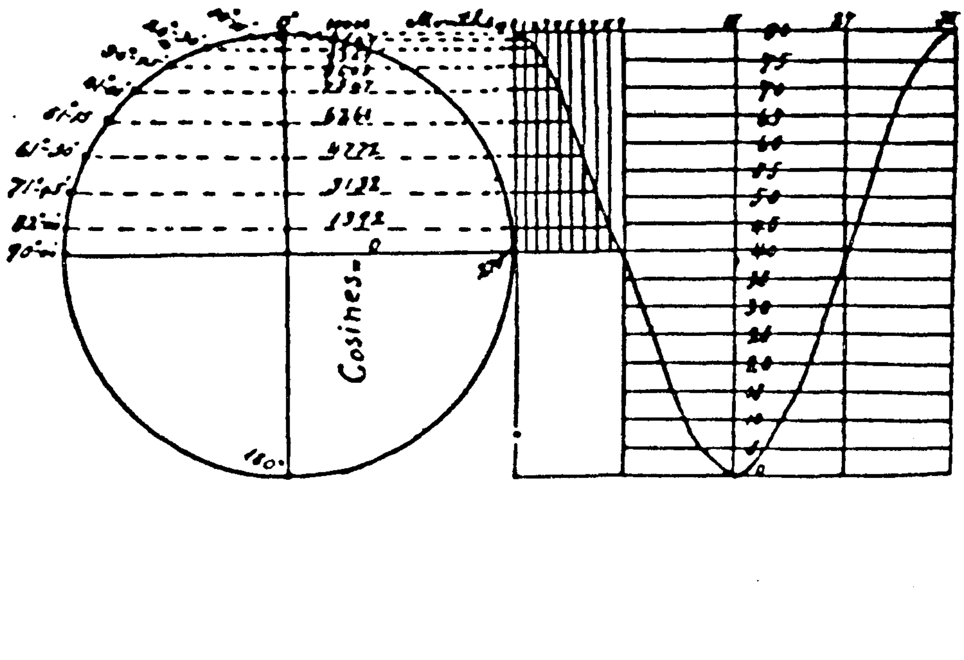
Generally we do not use the symbol y, but use A, B, C, and so on, and as a rule we write in the numerical evaluations of n and e, thus rendering the equations much more expressive.

Where there are several components to be combined we use what is called a sequence (a Fourier sequence) usually of the form

$$
\begin{aligned}
y = \; & A - a\cos(nt+e) \\
+ \; & B - b\cos(nt+e) \\
+ \; & C - c\cos(nt+e) \text{ etc., etc., etc.}
\end{aligned}
$$

Now this series of harmonics is merely a series of sine curves, or rather, cosine curves, because we elect to begin all our work herein at the maximums, in order to preserve some uniformity and avoid the confusion of using various sorts of starting points. Any one of the single components in this series might be graphically represented by itself as follows:

Figure 2. The Linear Graph, or Chart, of the Natural Sines. Illustrating the relation existing between orbital or cycli cal motion and linear representation. Also showing how the natural sine harmonics are derived. (Instead of sines we use their complement, the cosines, in all our work, because we chose to fit epochs to maximums.) The curve here is y equals cos x.



In this graph, Fig 2, illustrating the cosines, the unit of time is supposed to be a calendar month and its angular value about 10 15 , because the equation is

$$y = B - B \cos (nt + e)\ 10\ 15$$

and consequently there are 35 terms in it, for according to solution 360 ÷ 35 = 10 15. This is the equation of one of the harmonics of the Potato curve, later to be dealt with. Here it is to be observed that the diagram illustrates the relation between orbital motion in time and the natural cosines, thus, for the Potato curve, we plot

y= Terms	Angle	x= Cosines
0	0 00	10000
1	10 15	9842
2	20 30	9367
3	30 45	8594
4	41 00	7547
5	51 15	6260
6	61 30	4772
7	71 45	3132
8	82 00	1392
9	90 00	0

As is rulable in geometry this solves for the first quadrant, then for the second we reverse the order of x and proceed; for third we reverse back but change the algebraic sign in the equation; reverse lastly for fourth.

We may now take a ruler and by drawing in quadrille squares through this diagram to point off the units that are to be used in both abscissa and ordinate, make y any value we choose and also x any value we choose. Thus:

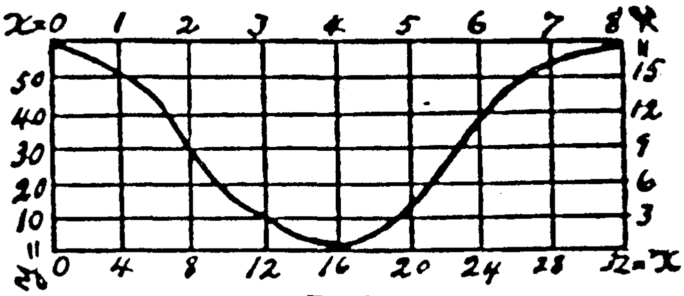


Fig. 3

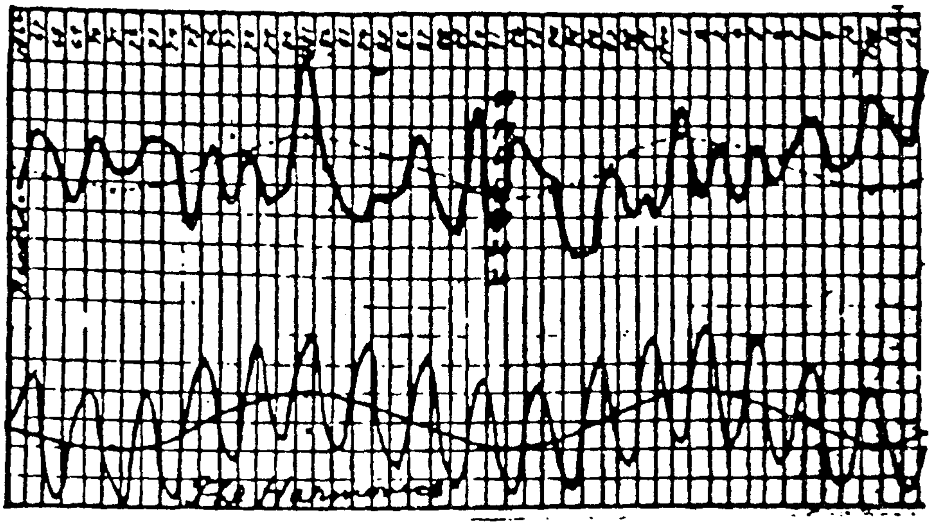
By merely evaluating the time units in x and the scale of amplitude in y, we secure any sort of figures that will suit our purpose, yet at the same time never in the smallest degree disturbing the position of the sine curve.

Perhaps an example showing the general mode of analysis and synthesis that will be adopted for use in this thesis will be more clearly grasped by the student than the abstract rules for solving tests with periodograms or least square examinations. For this purpose let us examine the price curve of potatoes as shown by the records in the United States. The figures and the diagram as below are the average market prices of potatoes in the United States during the month of December in the years as given, and are derived from the reports of the Department of Agriculture:

(Note; see chart on page following)

The Experience Curve of Potato Prices.

The upper curve represents the average price of potatoes in the United States for the month of December from the year 1866 to 1915, being the interim between two military disturbances. Beneath are the 2.934 and 20.536 harmonics.



The highly technical methods of applying periodograms of the amplitude of oscillation for the time units, and testing the deviations from the harmonics by the least squares may all be used if the student cares to take the pains to try them on the Potato curve or any other kind of a curve, but in actual practice the method here recommended and used is the common old method of "cut-and-try." If the investigator can not find any cycles by the simple cut-and-try plan then it is exceedingly probable he would never find any useful ones by means of the periodograms or the least squares. We do not want any cycles unless they are useful ones, and if they are useful they will almost certainly be plain enough in the records to admit of being picked up after a few trials with the cut-and-try plan.

From what has been said in the foregoing paragraphs, we reason that in the Potato curve of record, which we here have before us for discussion, there is a series of cycles, graphically representable in terms of the natural sines by sequence combination. This assumption is essential in our theory and must be our guide in all chosen modes of preceedure. We assume this curve must be a compound natural sine curve.

For convenience and for uniformity in all our work we begin by looking along at the maximum points in the Potato curve, as diagramed, with a view to noting the distribution of the tops in the general field of vision. By a little cut-and-try study we find these tops come out somewhere near 3 years apart. Also, we easily see by drawing a dotted line through in such a way as to represent the general averages in 3-year periods, that there must be a long-swing component of near 20 years.

This simple method of mere inspection, keeping in mind our fundamental theories, advances us at once to the point of determining very closely the two principal components of the Potato curve,

There is a top at the year 1867 and one at 1911, an interval of 44 years. In this interval there are 15 tops, then we reason that 44 divided by 15 equals 2.934, that is, the mean periodic time of the supposed 3 year cycle is really about 2.934 years, instead of exactly 3.

We now assume that there is a component of 2.934 years in the Potato curve, with probable epoch beginning at December, 1867. Supposing there is also a cycle of about 20 years, we may upon common theory assume that this cycle is the 7th harmonic of the 2.934-year cycle, so then 2.934 yrs X 7 = 20.538 yrs, and these are the cycles sought.

By this very simple, yet strictly mathematical and scientific process we are able to determine very closely the exact length of two harmonics in the Potato curve and fix their epochs, for we see quite plainly that, the cosines in the supposed 20-year cycle must osculate about in December of the years 1881 and 1901.

At this stage of the investigation we become prepared to test our assumptions based upon pure theory, namely the theory of geometrical cycles being useful in the art of prescience. Accordingly, we draw a sine curve of 20.5 years, because, as just explained, 20.5 years, or 246 months would be the length of the seventh harmonic curve of the before-determined 2.934 year cycle. This is in accord, also, with the common doctrine that the harmonics are usually multiples of each other, according to the showing of Fourier and Schuster. We take this harmonic as equal to 246 months and December 1881 as the time of its epoch. Now the seventh part of 20.5 will be about 35.14, therefore we shall assume that the length of the shorter period is about 35 months and 4 days, with its epoch to begin at December of the year 1867.

In the usual way we now superimpose the short periodic curve upon that of the longer period and upon diagraming the result get the Potato harmonic, as shown in the diagram below the record of potato prices. See Fig. 4.

It is now quite plain that our work so far has been fruitful. No doubt can well be entertained after comparing this theoretical curve with the record, as seen in the diagram, that it will serve fairly well as a forecasting curve. It is so good, in our estimation, that we may proceed to write the equations for it and adopt them as our working equations of the Potato Curve to be used in making conjectural extensions into future dates.

Keeping in mind the demonstration regarding cycles, as in preceding paragraphs, we equate the circle of 360 degrees with our cycle of 35.14 months, by simply saying

$$360 \div 35.14 = 10.244$$

That is, each unit of time, in our cycle, (a calendar month) is equal to 10.244 degrees on the periphery of a circle. Now in a circle there are four quadrants, according to geometrical notation, and in taking out the cosine values from a table of cosines (found in many mathematical works) we, for our purpose, begin at the top.

All this is made very clear in Fig. 2, where it is seen that the circle is divided into 35.14 units of 10 15 each and each unit in our problem being a calendar month. For each month, beginning with December 1867, we take out from a table of cosines the value given every 10 15 and tabulate it under the names of the calendar months and years from December 1867 to any future date that we may choose to extend it to.

In a like manner we get out the cosine values for the 246-months component, the degree unit being determined, by saying 360 ÷ 246 = 1.46, which is 1 28, and we therefore go along each 1 28 in the tables taking out the cosines for each calendar month from December 1881, both forward and back through the years as far as we may wish to compute the curve.

It must now be obvious to the student that if this is done for both components and for all calendar months in all years, we would have two cosine values for each of the months, and as the plus sign in the equation calls for addition we perform it, the sum being the

Potato Curve and its equation being

$$y = A - A \cos (nt + \text{Dec } 1881)\ 1\ 28 + B - B \cos (nt + \text{Deo } 1667)\ 10\ 15$$

Now the reader has before him the entire process, quite complete and fairly well explained, and it is believed that any person of ordinary capacity may easily understand and use it. The system is called the "geometric" system of conjecturing. It has been found to be of the very greatest value, and as it is based upon truly scientific principles, every step rigorously mathematical and all conolusions absolutely unaffected by any kind of exterior influence, it may be relied upon with the full confidence always warrantable in a correct mathematical result.

FORECASTING THE STOCK MARKET

We now come down to the business before us, namely, the work of forecasting the New York Stock Market by means of the geometric system treated of in the foregoing pages.

We first submit the Stock Market trend as of record to an examination under the common methods of harmonio analysis, similar to what was done with the Potato Curve, the only difference being that greater pains, greater detail and greater diversity of methods were really used in order to secure the results here to be fully explained and demonstrated.

End of Part 1

If the student has read the foregoing pages with reasonable care, and has fairly grasped their import, he may be considered as sufficiently advanced in the art of prescience to appreciate the grand and wonderful advantages that might be secured through the possession of the equations for solving the Stock Market curve in terms of the natural harmonics.

FINANCIAL LESSON NO. 2 gives these equations, as worked out by the Professor, quite as fully as can be desired. The market record itself is given in figures for a term of years; also diagramed; full explanations of how the cycles are derived and how their epochs are fixed; complete equations are given and explained; general methods to be used in a manner similar to those exemplified in deriving the Potato curve. In fine, this study given in Lesson No. 2 is to be considered as the delivery of the system of Stock Market forecasting, as regards the long swing components.

THE TEN-YEAR CYCLE

IN STOCK MARKET PRICES

As was remarked in the preceding pages, we are now down to the business of stock market forecasting, and, to gain this end, in the light of what has been said, we shall expect to find and demonstrate useful harmonic cycles in the stock market records. As was indicated, also, a greater diversity of method may be used in this case, the foregoing example having been designedly reduced to the utmost simplicity for the sake of easy comprehension. But now we shall proceed to look for the common geometric harmonics in the stock market averages, and, furthermore, we shall inquire into the reason why they are there, that is, the causes of them, and the natural laws governing the phenomena.

Upon diagraming the stock market average prices for each month in the year from 1873 to 1923, 50 years of record, embracing 600 months, we find, at almost the first glance, there is a 10-year cycle in it.

I should remark just here, however, that this cycle was recognized by numerous investigators many years ago. Perhaps the first writer to call particular attention to market cycles with a view to using them in forecasting, was Charles Dow (died in 1902) in some of his editorials while publishing a New York financial newspaper about in 1901. The cycle theory was often mentioned before, but it appears that Charles Dow, Mr. Gibson, Mr. Brown and a few diletante writers on finance had brought it forward in their writing at various times near the close of the last century. These writers treated the 10-year cycle as a mere curiosity and as a singular circumstance supporting some fond theory that they were endeavoring to explain. Not one of them made the smallest attempt to apply mathematical reasoning, or, indeed, any other kind of reasoning, to the case, being fully satisfied merely to mention the obvious circumstance and then pass on to things that seemed to them of greater importance.

It would probably become irksome to the reader if I labored through numerous pages of details in regard to the various studies and researches that I carried out during about 15 years of work on the problem, therefore it seems best to briefly remark that all my research tended strongly to indicate that the stock market average price curve rises and falls IN ACCORD WITH PLANETARY INFLUENCE.

While this idea might come to a few as a mild shook, it is in no way new. Mr. Carrington, Prof. Jevons and other writers many years ago mentioned it, but as they did not possess the modern records that we now have, they were unable to determine the price values equating with the planetary co-ordinates.

As a matter of fact, no mathematician before the year 1915 could have successfully analyzed the market curve by use of the planetary co-ordinates. But the excellent record we now have, from 1873 to 1923, lends itself readily to an effective determination of the harmonic values.

We now know what causes the principal long-swing movement in stocks. It is the varying distances between the two great planetary masse called JUPITER AND SATURN.

A text-book discussion of common astronomy could not be given space here, but as the planets Jupiter and

Saturn are the only ones dealt with in this thesis, we may briefly mention the following regarding them. These planets revolve around the Sun nearly in the ecliptic plane, in the same direction as Earth, Moon and all other planets. Jupiter has a periodic time of 11.86223 tropical years, while the periodic time of Saturn is 29.45772 tropical years. As a consequence these planets form heliocentric conjunctions in an average period of 19.853 years, that is, in 7251 days, 3 hours, 23 minutes, 24 seconds and 17 thirds. Between an opposition and a conjunction the mean time is a little less than 10 years, or is about 9.929 years.

By a carefully conducted research I found that the influence flowing from Jupiter and Saturn is nearly the same at oppositions as at conjunctions, the cycle being an irregular harmonic of ten calendar years. A rather singular thing was developed during the research. It seems that the influx has an annual governance. That is, to all appearane, each year in the cycle has its individual conformity predetermined for it as one unit in the cycle. No parts of units (years) are recognized. Each calendar year fits in without any overlapping of fractional parts. On this account some of the years of record repeat, while others skip one exact unit's place, i. e., skip a year. For example it was found that the years 1874 and 1889 each not only end a cycle but they also each begin the next one as well. But 1881 and 1901 are odd interpolations, the true end of the cycles occuring before them and after skipping them commence regular again, leaving these years entirely out. The law governing this peculiar irregularity is not perfectly known, but is is undoubtedly connected with the Earth's motion, that is, the irregularity arises from apparent retrograde motion due to Earth's position.

The question may be asked, "Do the other planets have any appreciable effects on stock market prices?" The answer is yes, but the law governing their action is not as yet well enough known to warrant their use in forecasting the long-swing movement in prices. They are used, under empiric rules, in conjecturing daily change, but the methods are not as yet perfected.

Making due allowance, according to above explanation, for the years 1874, 1881, 1889 and 1901, we have the years of the five cycles from 1873 to 1923 placed in order as shown by this table No. 1:

The equations in the common form may be written as follows, with the understanding that solution for each is for only one-quarter of the circle:

20 mo. A - a = cos 200 (÷ t Nov. 1st and 5th yrs) 9
28 mo. B - b = cos 200 (÷ t July 3rd and 7th yrs) 6 26.
10 mo. C - c = cos 70 (÷ t Nov. 9th year) 16 .
14 mo. D - d = cos 70 (÷ t Sept. of 10th year) 12 53.

The 20th harmonic begins in November of the 1st and 5th years of the cycle. The 28-months begins in July of the 3rd and 7th years. The 10-months begins in November of 9th year. The 14-months begins September of the 10th year of the cycle.

For diagraming purposes (as represented by the line of small stars in Diagram B) the following evaluations were adopted for each month in the several cycles, the figures being approximately the cosine terms as computed for the unit angle of each equation as above:

TABLE NO.3- THE EQUATIONS EVALUATED

MONTHS	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
20-MO. CURVE	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]								
28 MO. CURVE	0	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
15 MO. CURVE	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]																		
4 MO. CURVE	0	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]												

THE SECONDARY CYCLE

If we closely examine the composite, or forecast curve as made by the round dots in Diagram B, we at once perceive that somewhere around every 7 or 8 months there is a secondary maximum. Beginning with the first year of the cycle we would place the first of these maxima at March and next one in October; next one in May of the second year; again in January and September of the third year of the 10-year cycle, and so on, so on, in the following order, the figures showing how many months there are between amxima:

1	2	3	4	5	6	7	8	9	10
7 MAR, 7 OCT	7 MAY	8 JAN, 8 SEP	7 APR, 7 NOV	6 MAY, 6 NOV	7 JUNE	7 MAR, 8 SEPT	9 JUNE	10 APR	10 FEB, 6 AUG

It will at once be seen that there are 16 maxima of the Secondary in the 120 months of the cycle, the average being 7.5 months between maxima, which is about 225 days. Now the periodic time of the planet Venus is 224.7 days, just exactly the mean time between these maxima in the stock market composite record. Do not fail to grasp the full significance of the wonderful fact that the orbital period of Venus is the same length in days as the 16th harmonic of the ten-year cycle. This indicates that our curve is caused by Venus, Jupiter and Saturn and will continue so to be caused to eternity.

These Secondary maxima are a little closer together when the prices of stocks are high and they appear to be farther apart when prices are low, as well as during the transition period of the 8th and 9th year of the Primary cycle. The length of the Secondary varies between 6 and ten months. For a little over 3 months prices decline and then rise 4 or 5 months. The above tabulation (page 20) shows the months in the 10-year cycle when the maxima occur, the figure attached to each month in the table showing the length of the Secondary in that portion of the Primary.

With this data, together with Diagram B, the student should be able to get a very close line on stock market prices for any future year up to 1952, or longer.

The System

Strictly, this method of forecasting is properly called the "geometrical cycle system," because the fundamental essential of it is a cycle having geometrical harmonic regularity. But we find that certain planets, to all appearance, actually cause the phenomena, and we therefore assume that the action is really due to planetary modifications of telluric influx reacting upon the brain substance in the human organism. This was known to the ancient Egyptians, but we of the present day use slightly different notation and process in handling the facts.

For the purpose in hand, that is, in order to make up a conjecture as to the long-swing curve of the New York Stock Market, we first double the monthly mean price record together five folds corresponding in time with five meeting of Jupiter with Saturn, by conjunction and opposition. This composite gives us the curve to be used in forecasting. The influence from Venus is then assumed as manifesting in the form of a 16th harmonic superimposed upon the Jupiter-Saturn 10-year curve. This gives us the long-swing forecast. Other planets are not used in this curve. By a different treatment they are made to yield a result that is handled only for special purposes in a higher development of prognostic art than can be treated upon here. But I may remark that the student may go on to any degree of nicety with the principles lescribed.

Those students who wish to go exhaustively into the subject should have a good command of astrology, astromomy and mathematics. However, the main principles are easy to grasp, and Diagram A, should put the ideas well within reach of all. That diagram is designed to show the curve of influence produced on stock market prices by the varying angular distances of Jupiter from conjunction or opposition with Saturn. It will be seen that at 0 years and 0, which is supposed to represent the time of geocentric conjunction and opposition of the planets, the dotted curve, which is our composite price of stock in the 10-year cycle, same as per Table 2 and Diagram B, starts a little below the mean circle; then late in year 1 when distance is about 18 between the planets it goes to maximum height; then drops low in middle of year 3 at 54 ; rises to late in year 5 or 90 ; drops soon to a little late in the 7th year at 126 ; rises slowly to past the 9th year or 162 ; lastly, comes to a little below the mean again at 10 years, 180 , same as at beginning. Then at 180 another 10-year cycle starts and repeats this movement, and so on to eternity.

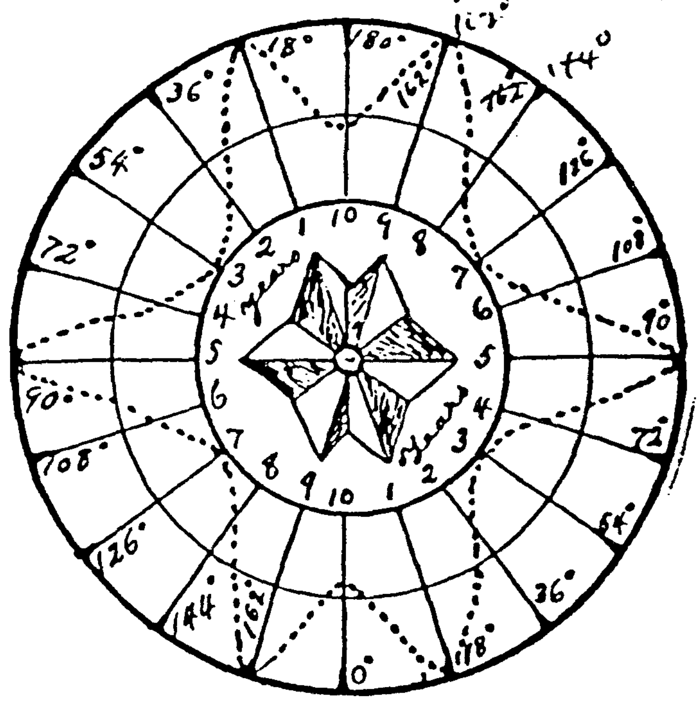
It is thus seen, by the dotted curve in this diagram that Jupiter and Saturn cayse maximum and minimum prices in the stock market when their geocentric angular distances between each other are about as follows:

Max.	Min.
18	54
90	126
162	180 and 0

This dotted curve shows positively that the planetary influence is what we call harmonic, meaning a wave-like motion, fixed in angular position like the crystals of a snow flake (hydrogen at low temperature) with 2 minor axis that join the major at 72 , as illustrated by the central part of this diagram.

Diagram A - The Influence of Jupiter and Saturn

Diagram A—The Influence of Jupiter and Saturn.



CONCLUSION

In these lessons, as delivered in this small booklet, the student should find the absolute foundation principles of true prognostic art as applied to financial conjecturing. Of course, the last word has not been said here. A very much higher development may be possible, but if the student adopts the general system here explained and uses it as the basis for his financial studies, he should soon become an adept market forecaster in the geometrical chart school, the only worthy school of financial conjecturing.

Undoubtedly twenty years of independent study would not advance a student as far as these short lessons have advanced him in a single reading of them. In a moment they open to him a great and wonderful new field of study wherein he may advance immediately, with full and abiding confidence, feeling as secure and safe in every step as the nature of such speculation can be expected to afford.

It is to be remembered that each student who receives these lessons is under a strict pledge of secrecy.

This is to protect all concerned. We are keeping the system as secret as we can, for if it became a matter of common knowledge much advantage would be lost to those now possessing it. So far the secret is confined to the rather small circle of the author's subscribers, and the hope is that this circle will widen only through this narrow channel.

NOTE-- The foregoing pages were printed in 1921 in the form of lessons for a few of the author's private students, the discussion of Mercury's influence being given later on typewritten pages. Now, after 7 years of secrecy, the entire set of lessons are here collect-ed in one booklet and published at $100, that the orig-inal may be secured as easily as any spurious imitations.

MERCURY IN STOCK MARKET FORECASTING

In the foregoing pages I have shown how I have de-termined the influence of Jupiter, Saturn and Venus on the long-swing price curve of stocks, leaving out of consideration Neptune, Uranus and Mars because it seems their cycles are too long, or too irregular.

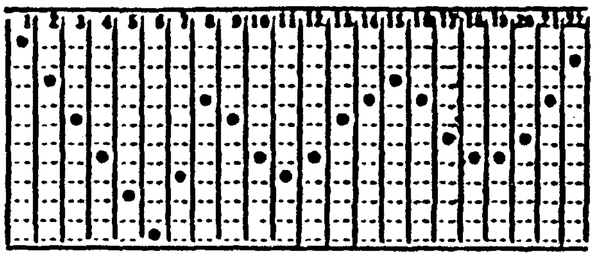
As Mercury's heliocentric periodic time is very nearly 88 days his fourth harmonic will be 22 days. While it is true that Mercury's angular motion varies greatly between perihelion and aphelion, yet by Kepler's law the radius vector traverses equal areas in equal times, thus maintaining a true harmonic as to orbital influence. The mean harmonic period is 22 days, but this varies between 19 and 25 days, 20, 21 and 22 days being closest.

Assuming that Mercury has a 22-day harmonic we readily perceive that this would be a very handy market cycle for use in forecasting, because all we will need for the work is merely the daily closing price of any stock for the past four months, which obviously contain at least five 22-day cycles.

When four months of daily prices for any stock are diagramed, in any months beginning and ending on any dates, there will be found tops in that diagram spaced about 22 days apart, representing the harmonics of Mercury. No ephemeries of Mercury is required, because the tops will be taken as the epochs in the 22-day cycles. With differing individual stocks this 22-day curve, taken forward from tops found spaced this way in the record, will differ. All stocks do not move alike and do not even have the same epoch dates, or dates of tops. However, the active stocks run pretty well together and on that account I found the general averages move in the 22-day Mercury harmonic naarly as in this diagram:

Stocks in the 22-Day Cycle

Stocks in the 22-Day Cycle



Under the theories herein proposed and presuming that we are handling the fourth harmonic of the planet Mercury, in order to forecast the daily price movement of any individual stock we merely diagram its daily closing price back from present date a few months. Because Mercury does not stop in his orbit on account of Sundays or holidays we allow same spacing and count for those days as for the others. We now look along in the chart so prepared and mark those tops in it which seem to be about 20 to 23 days apart. These are the assumed epochs of the planet's fourth harmonic as to its influence on that particular stock.

With four or five such 22-day periods before us on the daily chart of four months we have no trouble in comparing the movement, and, of course, diagraming it in the future 22 days, that is, making the forecast. Pay no attention to the long or major swings, because they are made by other planets. We here attend only to the daily fluctuations of this 22-day cycle, which ought to be somewhat like those shown in the above diagram.

You can add the record prices together for three or four cycles, thereby securing a composite for use as the forecast.

Table No. 1 · Six Cycles of Ten Years Each

Year . . .	1	2	3	4	5	6	7	8	9	10
Forecast	1922	1923	1924	1925	1926	1927	1928	1929	1930	1931
5th cycle .	1912	1913	1914	1915	1916	1917	1918	1919	1920	1921
4th cycle . .	1902	1903	1904	1905	1906	1907	1908	1909	1910	1911
3rd cycle . .	1891	1892	1893	1894	1895	1896	1897	1898	1899	1900
2nd cycle	1882	1883	1884	1885	1886	1887	1888	1889	1889	1890
1st cycle	1872	1873	1874	1874	1875	1876	1877	1878	1879	1880

Having in this way determined the position within the 10-year cycle of all the years from 1873 to 1931 inclusive, it becomes an easy and indeed a simple matter to average the mean monthly prices of stocks for each year in the first five cycles and use that average as a forecast for the next, or sixth, cycle. That is, we take the mean monthly stock market records for 1872, 1882, 1891, 1902, 1912, which all belong to first year of the cycle, add them together, divide by 5, and, obviously, we have an average of that year in the cycle which should answer quite well as a forecast for the year 1922, because it, too, belongs in the first year of the cycle. Proceeding in this manner for the second, third, fourth and every year in the determined order, we form a composite or average of the first 5 cycles, because we possess the market record of them, and the average thus secured becomes our completed forecast for all years in the next cycle.

This is undoubtedly perfectly clear to any one at all familiar with statistical methods of analysis. Simply add together the stock market price record of five 10-year cycles to get average values for a forecast.

This was done, producing the values as per Table 2, which values are represented by the curves in both Diagrams A and B. Any one may find this same curve if they will treat the actual market records as is here suggested.

(18)

Table No. 2 The Forecast Curve

Year	Jan	. . .	Mar	Apr	My	Jn	Jly	Aug	Sep	Oct	Nov	Dec
1	4136	4189	4195	4313	4311	4292	4316	4380	4413	4372	4252	4243
2	4240	4185	4125	4065	4023	3895	3867	3808	3690	3650	3640	3691
3	3764	3736	3748	3651	3531	3454	3359	3405	3487	3606	[illegible]	3661
4	3569	3630	3678	3681	3744	3563	3582	3730	3785	3918	3874	3969
5	3978	4021	4062	4088	4105	4195	4189	4289	4357	4373	4479	4365
6	4184	4065	3934	3848	3787	3740	3677	3558	3433	3180	3112	3077
7	3141	3087	3088	3066	3184	3191	3273	3459	3528	3336	3560	3583
8	3665	3581	3562	3580	3748	3790	3780	3840	3786	3760	3735	3722
9	3634	3718	3767	3771	3765	3737	3710	3773	3870	4021	4046	3918
10	4611	4022	3880	3971	3895	3777	3790	3780	3711	3712	3908	3683

This Table, No. 2, gives the sought-for set of figures for forecasting stock market prices. They are the unaffected monthly sums of five cycles, the curve being charted in Diagram B without any division or change. The figures are dollars and cents, but the last figure on the right was here omitted.

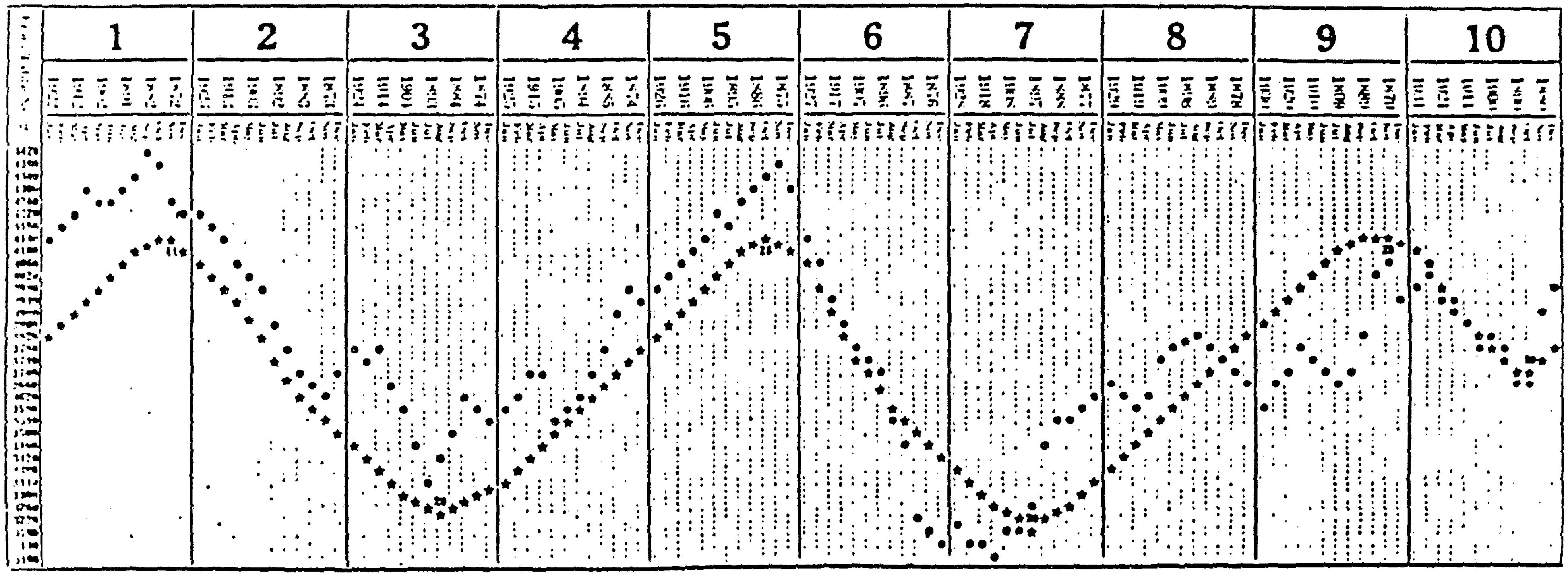
Now this curve is caused by Jupiter and Saturn, and, being what we call an irregular harmonic co-ordinated with the geocentric angles between these planets, we may represent it by geometrical formulae in very nearly the common cosine terms. There are two waves of 48 months' duration, followed by a wave 24 months long, and then repeated, for century after century, according to the influence of Jupiter and Saturn, as illustrated by Diagram A.

The common mathematical formulae for representing these harmonic curves is simply $y = \cos x$. But, as the wave is irregular, we compute cosines for each quadrant separately, thus avoiding any skew or complicated algebraical expressions. This is easily done because in the 48-month harmonic the curve runs down 20 months and up 28 months, while in the 24-months portion prices decline for 10 months but require 14 months to recover. This is clearly shown in Diagram B.

(19)

Diagram B

The Ten-Year Cycle of the New York Stock Market



This chart gives the values as in Table No. 2, represented by the small round dots under each month. This curve, made by the round dots, is the true forecast curve for the years in the cycles as per Table No. 1, these same years being also here given in heading

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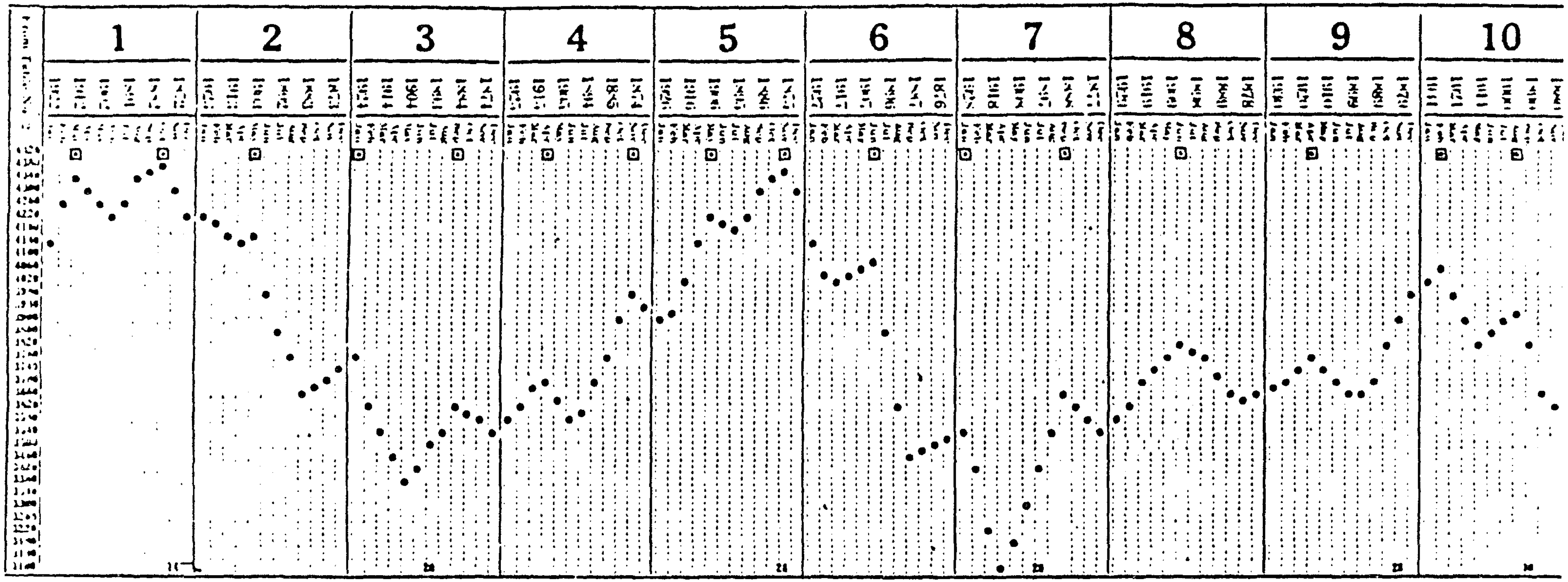
The curve in this chart made up of small stars is intended to approximately represent the harmonic of the Ten-Year Cycle. This harmonic is fully described in this booklet, and here it serves to indicate the regularity of the swings of 14, 20, 28 and 10 months

Diagram C

The Smoothed Forecast Curve of Stock Market Prices



This diagram gives the forecast curve smoothed out and with the theoretical Venusian Secondary superimposed upon it.

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It is believed that this smoothed curve is very near the mea movement of the stock market averages.