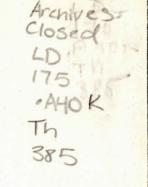
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AN ANALYSIS OF BIORHYTHMS AND THE EFFECT ON THE PERFORMANCE OF THE TWENTY LEADING LADY GOLF PROFESSIONALS OF 1975

AN ANALYSIS OF BIORHYTHMS AND THE EFFECT ON THE PERFORMANCE OF THE TWENTY LEADING LADY GOLF PROFESSIONALS OF 1975

A Thesis

Submitted to the Graduate Faculty of Appalachian State University in Partial Fulfillment of the

Requirement for the Degree Master

of Arts

in

The Department of Health, Physical Education and Recreation

by

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Dean of the Graduate School

# DEDICATION

This study is dedicated to my father, the late Bernard H. Jano.

# ACKNOWLEDGMENTS

...

The investigator would like to express her appreciation to Mr. Roger Thomas for his encouragement and professional guidance in the completion of the study. In addition, the investigator would like to thank Dr. Larry Kitchens and Mr. Sam Rosenbleeth for their assistance on the statistics for the study.

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#### ABSTRACT

The purpose of this study was to analyze the differences among four computations of conventional biorhythmic efficiency indices and performance score indices of twenty lady professional golfers. The subjects consisted of the top twenty money winners of the Ladies Professional Golf Association for the year 1975. Each subject's birthdate and daily tournament scores were collected from the LPGA. The golfer's physical, emotional, intellectual and mixed biorhythms were calculated for the year 1975. These calculations were classified as one, two or three for average/ above average biorhythmic efficiency, below average biorhythmic efficiency and critical biorhythmic efficiency according to the conventional biorhythm theory.

For the days the golfers performed in a tournament, deviations were established from each golfer's mean performance score for the year 1975. Data from the biorhythm calculations and performance score deviations were analyzed through the analysis of variance for the one-way design. Differences between biorhythmic calculations and actual performances were determined.

The findings of this study were as follows:

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1. There was no significant difference among the treatment groups of the physical cycle according to the

conventional biorhythm theory analyzed by the one-way analysis of variance.

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2. There was no significant difference among the treatment groups of the emotional cycle according to the conventional biorhythm theory analyzed by the one-way analysis of variance.

3. There was no significant difference among the treatment groups of the intellectual cycle according to the conventional biorhythm theory analyzed by the one-way analysis of variance.

4. There was no significant difference among the treatment groups of the mixed cycle according to the conventional biorhythm theory analyzed by the one-way analysis of variance.

5. As displayed by the four computations of Fratios, the analysis of variance disclosed non-significant differences between performance scores and biorhythmic efficiencies of average/above average, below average and critical according to the conventional biorhythm method of interpretation.

> The following conclusions were drawn from the study: 1. A review of current literature indicated that

intrinsic and extrinsic variables may have influenced the performance of the golfers enough to overwhelm the potential outcomes of the biorhythms.

2. The results of the study, analyzed by utilizing the analysis of variance for one-way design, inferred that

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the four rhythmic cycles did not have a significant effect on the performances of the top twenty lady golfers.

Chapter I

#### INTRODUCTION

Physical educators and coaches have often questioned why a player performs differently from day to day. A welltrained athlete can break a world record one day and the following day perform poorly. Physical educators and coaches may question the teaching and coaching techniques; however, with this disparity in performance, the instructor or coach may also observe differences in the physical, emotional and intellectual behaviors of the player on a daily basis. Could these three behaviors influence the physical performances of a well-trained athlete?

Fluctuations of behavior were noted circa the time of Hippocrates. The philosophical physician instructed students and colleagues to consider treatment according to good and bad days of the patients.<sup>1</sup>

Before the nineteenth century, it was recognized that man had days that alternated from good to bad. However, no one asked why. Extensive research had already taken place in biology and zoology to describe the regular rhythmical processes of single-cellular and multi-cellular

George S. Thommen, <u>Is This Your Day?</u> (New York: Crown Publishers, 1973), p. 13.

organisms based on the twenty-four hour clock.<sup>2</sup> These circadian rhythms are inborn within the individual.

. . . That is, the period is not learned, or imprinted upon organisms by the twenty-four daynight light and temperature cycles produced by the rotation of the earth.<sup>3</sup>

Swoboda thought there must also be a rhythm pattern in man to cause fluctuations in behavior. This investigator said.

. . . the best of health does not prevent man from feeling unwell at times, or less cheerful than he is normally.4

Fliess, a Berlin surgeon, theorized in the early 1900s that man had two cycles, the physical or male cycle consisting of twenty-three days and the emotional or female cycle consisting of twenty-eight days. A third cycle called the intellectual cycle was introduced later. Thus, the theory of the biorhythm and bionomy was derived.

This study was designed to help the investigator determine how much emphasis should be placed on the biorhythm theory to performance in golf. If the biorhythmic study was applicable, the statistical analysis of the

<sup>5</sup>Martin Gardner, "Mathematical Games," Scientific American, 215:1:108-111, July 1966.

<sup>6</sup>Thommen, op. cit., p. 15.

biorhythms could possibly inform the individual of the upcoming highs, lows, and critical days so activities could be adapted accordingly.

If this theory were conducive to determining potentials of behavior and performance, biorhythmical charting, if applied, should benefit the golfer to better enhance the performance during competitive situations.<sup>7</sup>

#### STATEMENT OF THE PROBLEM

The purpose of this study was to compare the differences among the biorhythmic patterns to the competitive performances of the top twenty money winners in the Ladies Professional Golf Association for the year 1975.

# Sub-problems

Several sub-problems were considered while conducting the study:

1. Selecting the subjects and tournaments used in the study.

2. Recording the deviation of the golfer's daily performance scores during competition from each individual's 1975 average score.

3. Calculating and classifying each subject's physical, emotional, intellectual and mixed biorhythms. 4. Organizing and analyzing of the data.

7<sub>Ibid., p. 27.</sub>

<sup>&</sup>lt;sup>2</sup>Frank A. Brown, J. Woodland Hastings, and John D. Palmer, The Biological Clocks (New York: Academic Press, 1970), p. 3.

<sup>&</sup>lt;sup>3</sup>Ibid., p. 8.

<sup>&</sup>lt;sup>4</sup>Thommen, op. cit., p. 14.

#### HYPOTHESES

The hypotheses tested in this investigation were:

1. Individual performances, as classified from 1975 scoring averages, were not significant to the interpretation of the biorhythmic statistics in the physical cycle.

2. Individual performances, as classified from 1975 scoring averages, were not significant to the interpretation of the biorhythmic statistics in the emotional cycle.

3. Individual performances, as classified from 1975 scoring averages, were not significant to the interpretation of the biorhythmic statistics in the intellectual cycle.

4. Individual performances, as classified from 1975 scoring averages, were not significant to the interpretation of the biorhythmic statistics in the mixed cycle.

5. Individual performances, as classified from 1975 scoring averages, were not significant to the midline critical point interpretation in the three original cycles.

#### DEFINITION OF TERMS

#### Above Average Performance Score

......

H1 through H5 used the classification of numerical scores higher than the yearly average score to designate above average performance scores.

#### Amplitude

Amplitude was the height of an oscillation.8

# Average or Above Average Biorhythmic Performance

interpreted as being average or above average biorhythmic performance for classification purposes.

#### Average Score

Average score was the mathematical average of all the performance scores of an individual golfer for the year 1975.

# Below Average Biorhythmic Performance

All points below the expected average biorhythmical positions on the sine curve scale were designated as being the expected below average biorhythmic performances in the cycles.

# Below Average Performance Scores

H1 through H5 utilized the classification of numerical scores lower than the yearly average score to designate below average performance scores.

<sup>8</sup>W. P. Colquhoun, <u>Biological Rhythms and Human</u> Performance (New York: Academic Press, 1971), p. 4.

All points at least one point above the midline were

# Bionomy

A psychological prediction of the rhythmical cycles in man was called bionomy.

#### Biorhythm

Biorhythm was the theory related to the life cycles of physical, emotional, and intellectual behavior in man.<sup>10</sup>

#### Circadian Rhythm

A circadian rhythm was a cycle consisting of twentyone to twenty-eight hours.<sup>11</sup>

### Composite

The composite was the ". . . algebraic sum of values assigned to each day of each cycle . . . " that took into account personality types.<sup>12</sup>

# Critical

The critical day occurred when the first and last days of the cycle crossed the midline or when a cycle

<sup>9</sup>Thommen, op. cit., p. 15.

<sup>10</sup>Jean Mackenzie, "How Biorhythms Affect Your Life," Science Digest, 74:2:20, August 1973.

<sup>11</sup>Fred G. Delacerda and Ralph E. Steban, "The Effect of an Endurance Type Exercise Program on the Circadian Rhythm of Urinary 17-Ketosteroids," Medicine and Science in Sports, 6:2:126, Summer 1974.

<sup>12</sup>Barbara O'Neil and Richard Phillips, Biorhythms: How to Live with Your Life Cycles (Pasadena: Ward Ritchie Press, 1975), pp. 14-15.

crossed from positive to negative or vice versa.<sup>13</sup> For the purposes of this study, H<sub>5</sub> utilized the above conventional interpretation to define the critical position. 14

#### Discharge Phase

A discharge phase was a time of increased efficiency.15

## Endogen

6

An endogen was one of the two main categories of biological rhythms which originated its response within the organism. It was also known as the "active system."16

#### Emotional Cycle

This cycle was also referred to as the feminine or sensitivity cycle and was composed of twenty-eight davs.17

#### Exogen

An exogen was one of the two main categories of biological rhythms which originated its responses outside

<sup>13</sup>Thommen, op. cit., p. 57.

<sup>14</sup>Harold R. Willis, "Biorhythm and Its Relationship to Human Error" (proceedings of the Sixteenth Annual Meeting of the Human Factors Society, Santa Monica, California, October 17-19, 1972), p. 280.

<sup>15</sup>Thommen, loc. cit.

<sup>16</sup>Harold R. Willis, "Rationale for Biorhythm Cycles" (paper presented at the N. L. Industries, TAC Workshop-Seminar, New York University, New York, June 5, 1974), p. 4.

<sup>17</sup>Thommen, op. cit., p. 53.

of the organism. It was also known as the "passive system."18

# Half Periodic Day

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The point when the cycle switches from positive to negative phase and was also referred to as the critical day. 19

# Intellectual Cycle

This cycle was concerned with creativity and cognitive abilities. It consisted of thirty-three days. 20

#### Linear Oscillator

An alternation of two energy stores in a sine wave pattern was a linear oscillator.<sup>21</sup>

#### Mixed Rhythm

For the purpose of this study, all the three cycles were examined together by taking an average of the three cycles on each day.

#### Negative Phase

All points below the midline were in the negative phase.

> <sup>18</sup>Colguhoun, op. cit., p. 18. 19Thommen, op. cit., p. 57. <sup>20</sup>Ibid., p. 55. <sup>21</sup>Colguhoun, op. cit., p. 3.

#### Performance Scores

Daily golf scores of each subject during competition were the performance scores.

# Period

8

A period was a completed cycle or could also be referred to as half-periodic or critical phase of a cycle.<sup>22</sup>

#### Phase

# Physical Cycle

This cycle was concerned with physical endurance and was composed of twenty-three days.<sup>24</sup>

## Positive Phase

phase.

#### Regenerative Phase

The regenerative phase was a time of lessened efficiency.<sup>25</sup>

22 Gay G. Luce, Biological Rhythms in Human and Animal Physiology (New York: Dover Publications, Inc., 1971, p. 9. <sup>23</sup>Colquhoun, op. cit., p. 4. <sup>24</sup>Thommen, op. cit., p. 51. <sup>25</sup>Ibid., p. 57.

A phase was a section of the complete cycle.<sup>23</sup>

All points above the midline were in the positive

## Sine Curve

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A sine curve was a linear oscillator<sup>26</sup> which showed discharging or plus half periods on the top half of the graph above the horizontal line and the recharging or minus half periods on the lower half of the graph below the horizontal line. The height and width of the curves were determined for each individual.<sup>27</sup>

#### Zietgeber

Zeitgeber was the German term given to describe the synchronization of a circadian rhythm.<sup>28</sup>

#### DELIMITATIONS

The delimitations of this study were as follows:

1. This investigation encompassed the 1975 golf tournaments of the Ladies Professional Golf Association. The top twenty money winners for the 1975 ladies tour were the subjects of this investigation. Performance scores of each tournament were collected beginning on January 18, 1975 and ending on December 14, 1975.

2. Biorhythmic statistical calculations were performed for the physical, emotional, and intellectual

<sup>28</sup>Erwin Bünning, ed., <u>Cold Spring Harbor Symposia</u> Quantitative Biology, Vol. XXV, (opening address: Biological Clocks) (Baltimore: Waverly Press, Inc., 1960), p. 11.

cycles. The birthdates of the top twenty money winners in 1975 were used to perform the biorhythmic statistical calculations for the physical, emotional, and intellectual cycles. From these calculations, averages were computed in order to disclose the mixed rhythm cycle.

...

# LIMITATIONS

There were elements within the study that may have deterred the results of the investigation. The limitations were as follows:

A total of thirty-three official and unofficial tournaments were scheduled by the LPGA for the year 1975. The United States Open Tournament was deleted from the study because the daily scores were not given in the LPGA Player Guide 1976. Also, the Colgate European Ladies Open was eliminated because of an error by the investigator in the final organization of the data.

Other circumstances the investigator did not make allowances for were atmospheric conditions during each day of play, golf course conditions and individual golf course ratings. These situations could have been a contingent factor to the player's behavior and golf score.

<sup>&</sup>lt;sup>26</sup>Colquhoun, loc. cit.

<sup>&</sup>lt;sup>27</sup>Thommen, op. cit., p. 45.

#### Chapter II

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#### **REVIEW OF RELATED LITERATURE**

The review of literature revealed a scarcity of completed research pertaining to the use of biorhythm statistics in athletics. The review was divided into four sections. The first section reviewed the two main hypotheses of the origin of rhythms. The historical background of the biorhythm theory was contained in the second section. The third section disclosed the many characteristics of the biorhythm cycles, while the fourth section was concerned with studies related to demonstrating how biorhythms have been used in medicine, industry and athletics.

#### THE MASTER CONTROLLER--TWO VIEWS

At the moment of conception, when the sperm penetrates the ovum, the cycle of life begins within the womb of the mother. ". . . Cycles lasting only microseconds to the 90-minute cycles seen in sleep, cycles of about a week, monthly, seasonal, and even annual rhythms . . . " occur within the living organism.<sup>1</sup> However, what and where was this "Master Clock" that started these rhythms of life?

The term biorhythm was a Greek word for "life-beat." It was linked with the fine arts of music and verse. Thommen makes the analogy ". . . that Nature is the composer; man, as a human being is the instrument upon which Nature plays her rhapsodies; man, as a scientist, is the listener . . . "2 Biorhythm is based upon what scientists referred to as biological rhythms since the age of Aristotle.<sup>3</sup> Hippocrates also noticed the "good" and "bad" days of his patients and treated them accordingly.<sup>4</sup> Therapies used by the early Greeks were called "metasyncrasies." The treatments involved the partaking of the same three foods and exercises at intervals of every seven days in order to fluctuate with the different moods.<sup>5</sup>

Biological rhythms occur regularly at all levels of the plant and animal kingdoms, from the single-celled to the multicellular organisms.<sup>6</sup> However, biological rhythm research began in the discipline of botany in the eighteenth century. Twenty-four hour circadian movements were first observed in leaves and flowers. During this time, Mead,

<sup>1</sup> Gay G. Luce, Biological Rhythms in Human and Animal Physiology (New York: Dover Publications, Inc., 1971), p. 46.

<sup>&</sup>lt;sup>2</sup>George S. Thommen, <u>Is This Your Day?</u> (New York: Crown Publishers, 1973), p. 13. <sup>3</sup>Frank A. Brown, J. Woodland Hastings, and John D. Palmer, The Biological Clocks (New York: Academic Press, 1970), p. 3. <sup>4</sup>Thommen, op. cit., p. 13. <sup>5</sup>Luce, op. cit., p. 8.

<sup>&</sup>lt;sup>6</sup>Brown, op. cit., p. 8.

a British physician, reported the significance of the sun and moon orbits to the outbreak of illnesses.<sup>7</sup>

It appears there are many rhythms and perhaps many clocks under the direction of a master controller which coordinates the ebb and flow of complex functions such as internal secretions, metabolism of food and chemicals, sleeping and waking, fluctuation in mood, and even the division of cells.<sup>8</sup>

Painstaking scientific experiments in the areas of chemical, psychological and behavioral rhythms were not endeavored until several decades ago.<sup>9</sup>

Cloudsley-Thompson, one of the major authorities on biological rhythms gave three hypotheses of how biological rhythms were derived. "'They are learned. They are inherited. They depend on reactions to cosmic stimuli.'" In 1961, Cloudsley-Thompson stated that the precision of the "clocks" originated through the decisive method of natural selection.<sup>10</sup> However, the two most recognized schools of thought are predicated upon the endogenous clock hypothesis and the exogenous clock hypothesis.<sup>11</sup>

<sup>7</sup>Luce, op. cit., pp. 8, 11.

<sup>8</sup>Henry Still, <u>Of Time, Tides, and Inner Clocks</u> (Harrisburg, Pennsylvania: Stackpole Books, 1972), p. 46.

<sup>9</sup>Joan Lynn Arehart, "The Search for Clues to the Rhythms of Life," <u>Science News</u>, 100:11:178. September 11, 1971.

<sup>10</sup>Harold R. Willis, "Rationale for Biorhythm Cycles" (paper presented at the N. L. Industries, TAC Workshop-Seminar, New York University, New York, June 5, 1974), p. 1.

<sup>11</sup>Arehart, loc. cit.

A central problem here is to establish whether or not any observed behavioural [sic] rhythm is generated by the organism itself and gets locked or entrained to the environmental periodicity at a particular phase or whether it is the external rhythm which causes the periodicity in the organism directly.<sup>12</sup>

The endogenous clock hypothesis, also known as the "active system," was the basis for the first school of thought. Whether there is only one biological clock or many clocks that act as their own timing device is still unknown.<sup>13</sup>

The second hypothesis of inheritance was based on the work of Hastings. His supposition was that the environmental conditions had no effect on the organisms. Instead, it was the independent metabolism constituents of the cells that created the rhythms of the organism. The cells for millions of years adjusted to good and bad conditions until the organisms could predict these periods through a metabolic timer.<sup>14</sup> Hasting's partiality leans toward the first school of thought, but does not disregard the second school completely.<sup>15</sup>

Dewey is biased toward the endogenous clock. This researcher wrote,

<sup>12</sup>W. P. Colquhoun, <u>Biological Rhythms and Human</u> <u>Performance</u> (New York: Academic Press, 1971), p. 7. <sup>13</sup>Arehart, loc. cit. <sup>14</sup>Brown, op. cit., pp. 12, 22. <sup>15</sup>Arehart, op. cit., p. 179.

. . . these 'clocks' (still not located if they do exist) are strictly internal devices uninfluenced from the outside . . . or affected by outside forces.<sup>16</sup>

.....

Pauly and Schwing, from the University of Arkansas Medical Center, studied fifty different rhythms in their patients, the aged and military volunteers. These doctors' investigations confirmed that their research was toward the endogenous school of thought.<sup>17</sup>

Another investigation demonstrated that plants fluctuate according to light intensity. These observations were reported by Hamner of the University of Southern California. Hamner stated that his bias was oriented more toward the first school of thought; however, external forces could not be disregarded. 18

Hoagland developed the "chemical clock" theory in 1931 at Clark University and later explored the relationship between human physiology and psychological behavior. Hoagland supported the internal theory and was one of the first scientists to promote biological rhythms as a reliable source to describe human behavior.

Much of the overt behavior of organisms is determined by the interrelations between chemical events within the cells and groups of cells, quite independently of external environmental factors.<sup>19</sup>

16 Edward R. Dewey, Cycles, The Mysterious Forces that Trigger Events (New York: Hawthorne Books, Inc., 1971), p. 38.

> <sup>17</sup>Arehart, loc. cit. 18<sub>Thid</sub>

<sup>19</sup>Willis. "Rationale for Biorhythm Cycles," op. cit., p. 3.

Furlong stated that man has an inner clock ". . . that was not regulated by such external stimuli as night and day or changing temperature." According to Furlong, everything changes: mental alertness, tastes, odors, music, moods and feelings.<sup>20</sup>

Bunning, of the University of Tubingen, Germany, theorized that most biological rhythms, if not all of them, function because of internal devices. "Considering the fact that DNA carries life's genetic code; . . . then too it may well provide the biorhythm patterns."<sup>21</sup> Bünning believed that the "master clock" in the upper hierarchy of the animal kingdom lay within the central nervous system.<sup>22</sup>

Bunning, in the 1930s, found that the periods repeated rhythmically at interspaces of approximately twenty-four hours.

Organisms have the ability, that is, to draw energy from a constant source and convert it into more useful alternating cycles, which are then displayed as rhythmic phases of activity like the hands of a clock returning to midnight once each day.<sup>23</sup>

<sup>20</sup>William Barry Furlong, "What Makes Us Tick So Mysteriously," Today's Health, 49:5:29, May 1971. <sup>21</sup>Willis, "Rationale for Biorhythm Cycles," op.

cit., p. 5.

<sup>22</sup>G. J. Whitrow, The Nature of Time (New York: Holt, Rinehart and Winston, 1972), p. 63.

<sup>23</sup>Ritchie R. Ward, The Living Clocks (New York: Alfred A. Knopf Publishers, 1971), p. 160.

#### Ehert, et al.,

. . . visualizes very long DNA molecules at the heart of the time keeping [sic] sequence, and refers to them as chronons.

The rate of construction of the DNA molecule could be visualized ". . . as functioning like the escapement of a watch . . . "--totally devoid of external forces acting upon it.24

In 1950. Kramer expounded on the Bünning hypothesis. Through his study of migratory flights of birds, Kramer originated the idea that birds ascertained direction throuh use of the sun's seasonal path across the sky. However, because of the continuous movement of the sun, Kramer observed the birds making adjustments ". . . through the use of an internal clock."25

Many scientists (Lehmann, Blake, Willis, Hoagland, and Monroe<sup>26</sup>) believed that diurnal temperatures can determine performances or efficiencies to a high degree. Lehman found in his studies that from six a.m. to between nine and eleven a.m. efficiencies increased; therefore, there were

<sup>24</sup>Willis, "Rationale for Biorhythm Cycles," loc. cit.

<sup>25</sup>Ward, op. cit., p. 184.

<sup>26</sup>Diego Pupo Nogueira, "Accidents during Work and Time of the Day," Industrial Medicine, 40:6:28-29, September 1971; see also M. J. F. Blake, "Timing of Day Effects on Performance in a Range of Tasks," Psychonomic Science, 9:6:350, September-December 1967; see also Willis, "Rationale for Biorhythm Cycles," op. cit., p. 6; see also Luce, op. cit., p. 5.

fewer accidents. A decrease occurred around noon or a little after and again rose until its second high occurred around three and four in the afternoon. The majority of accidents developed around midday. 27

From the studies of Hoagland and Monroe, an individual could be categorized as a "night hawk" or an "early bird" by the high points in temperatures. Someone whose temperature was subnormal when first waking up could be categorized as a "night hawk," or the least active in the morning hours. A person who awakened with normal temperature reading would be in the category of the "early bird" or the most active during the morning hours.<sup>28</sup>

Other ideas of the "master controller's" origins, according to the intrinsic viewpoint, were seen in studies of hormonal dependencies. According to Still, the adrenal glands played an important role in determining the fluctuations in the emotional cycle. The increase and decrease of adrenal steroids during this cycle was first reported in 1948.

The importance of adrenal hormones to the upand-down waves or physical and mental processes has tempted scientists to search for the central controller, or master biological clock, in the adrenal glands.29

Research was begun recently on determining the real

purpose of the glial cells which encompassed the neurons.

<sup>27</sup>Nogueira, loc. cit. <sup>28</sup>Luce, op. cit., p. 44. <sup>29</sup>Still, op. cit., pp. 118, 120.

The supposition that these cells not only feed the nerve cells but ". . . may be very important in the electrical wave transmission of the brain, for they appear to modulate the excitability of the neurons"<sup>30</sup> was considered.

In this same area of study of the relationship of the nervous system to fluctuations in behavior, Beeker, Brachman, and Friedman discussed their findings in the New

# York State Journal of Medicine.

....

Since the cranial Direct Current potential appeared to be a particularly important parameter in the state of consciousness or level of irritability in the human being, the possibility that it was the controlling mechanism for biological cyclic behavior was considered. In a preliminary study the transcranial D.C. potentials of two normal subjects and two schizophrenic patients was determined daily for a period of two months. A definite cyclic pattern was evident in all four subjects, with a periodicity of approximately 28 days, and with all four following similar cycles.<sup>31</sup>

The second school of thought, the exogenous hypothesis, contends that the "master controller" was not internal in the organism. The pacemaker was caused by external or exogenous forces such as electromagnetic fields, temperature and light.<sup>32</sup> Frank A. Brown, Professor at Northwestern University, experimented in 1957. Through the studies conducted, Brown's viewpoint leaned more toward this school of thought. Brown believed that under strictly controlled experimental conditions the organisms

> <sup>30</sup>Willis. "Rationale for Biorhythm Cycles," op. cit. <sup>31</sup>Ibid., p. 7. <sup>32</sup>Arehart, op. cit., p. 178.

. . . were using subtle, rhythmic geophysical This scientist found from experiments conducted that . . . that at half-monthly intervals there is Further support of extrinsic factors controlling the . . . Scientists have not yet proved that

forces--those that easily permeated the barriers of an experimental set up--as an informational input to time their overt rhythmic processes.<sup>33</sup> the cycles followed a pattern based on the twenty-four hour day and the human female menstrual cycle of approximately twenty-nine and one-half day rhythm. According to Brown. it is these rhythmical cycles that regulate our physical, emotional, and intellectual behaviors to any time zone on the earth during jet travel. Brown stated, increased activity during the late morning hours. Here then is a remarkably precise, persistent, semimonthly rhythm in running activity.35 rhythms of organisms have persisted through the centuries in astrology. living creatures are not influenced in their cyclic variations by subtle forces emanating from the planets, sun, moon, and the earth itself. Brown is a believer of these cosmic forces of the moon's phases, sunspots' radiational and gravitational forces

emanating from the earth itself.<sup>36</sup> "'All research to date

<sup>33</sup>Brown, op. cit., p. 12.

<sup>34</sup>Joan Lynn Arehart, "Biorhythm Theory Claims Ability to Spot Accident Prone Periods," Aviation Week Magazine, 74:4:102, January 23, 1961.

<sup>35</sup>Brown, op. cit., pp. 18, 22.

<sup>36</sup>Still, op. cit., pp. 18, 21.

shows the influence of geophysical factors on rhythms, yet only some research suggests an internal factor.'"<sup>37</sup>

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Becker, an orthopedic surgeon at the Veterans Administration Hospital in Syracuse, New York, stated the postulation of electromagnetic forces as being the key to the "master controller" has only been accepted in the past five years. In Becker's studies, it was found that the molecular make-up of the organism acts as electrical conductor and that different charges causing changes in the body's physiology could cause changes in the epiphyseal area of the skeletal system.<sup>38</sup>

Burr of Yale University said that the circuitry of the brain regulates the processes of the body. According to Burr, the brain is really an intricate magnetic field. A gland found in the brain called the pineal gland acts in lower animals as a third eye. Because it is close to the surface in these lower animals, light affects it and is ". . . believed to be a coupling device regulating the phase relations among biological rhythms." Scientists believe that in the human the optic nerve somehow triggers the pineal gland to function as in the lower animals.<sup>39</sup>

In studies of bird flights of Kramer, the sun's light influenced the flight patterns of the birds.

 $^{37}\ensuremath{\text{Arehart}}$  , "The Search . . . to the Rhythms of Life," loc. cit.

<sup>38</sup>Ibid., p. 179. <sup>39</sup>Still, op. cit., pp. 22, 52.

Therefore, ". . . intensity of illumination might influence the activity and physiological rhythms of man, as it does influence birds."  $^{40}$ 

.....

Luce stated that ". . . one of the most potent and ubiquitous triggers of biological rhythms is light--visible light from the sun and moon . . ."<sup>41</sup> In a study performed on nineteen females' menstrual cycles to determine illumination during the fourteenth through seventeenth nights of the cycle, the investigation showed significance. "The result over the course of a hundred-monthly [*sic*] cycles was the regularization of their cycles to 29.5 days, the synodical period of the moon."<sup>42</sup>

Colquhoun stated that a woman's psyche and soma are affected by the menstruum. Colquhoun noted in his investigation that there were two periods in which disturbances were observed in the physiological and psychological activity of the female subject. "One was the premenstrual phase, which was accompanied by irritability and tension; the other occurred around the time of ovulation . . ." Reports by Benedek and Rubenstein in 1939 explained the

40 Luce, op, cit., p. 141. <sup>41</sup>Gay Gaer Luce, "Trust Your Body Rhythms," <u>Psychology Today</u>, 8:11:52, April 1975.

<sup>42</sup>Arehart, "The Search . . . to the Rhythms of Life," op. cit., p. 179.

time of ovulation as being a mitigated period for the female. 43

Along with the possibilities of the moon's influence on the menstrual cycle is the evidence that seventeen percent more babies are born on waxing phases than on wanning phases of the lunar cycle. Death rates due to tuberculosis seemed to occur more during the full moon. 44

However, the most powerful external force that could be the "controller" of behavior may be totally social in nature. In a study in 1965 by Reinberg et al., the report showed that seven women who lived in two different tents in a cavern functioned differently according to the tents lived in. Even inherited rhythms, said Luce, seemed to be brought out by the influences of social Zeitgebers such as a baby urinating regularly as it grows older or developing Huntington's Chorea genetic disease. 45

The belief that there was only one "master controller" regulating the different fluctuations in behavior has lost popularity. "It is abundantly clear that healthy living things are not only internally rhythmic; they are also synchronized with their environment."46 Until otherwise

<sup>43</sup>Colquhoun, op. cit., pp. 212, 213. <sup>44</sup>Dewey, op. cit., pp. 177-178. 45 Luce, Biological Rhythms . . . and Animal Physiology, op. cit., pp. 12, 141. 46 Ibid.

proven, this eclectic viewpoint will remain the basis of explanation of the origin of the "master controller."

#### HISTORICAL BACKGROUND OF BIORHYTHMS

While the biologist and zoologist researched the reasons the lower species of the plant and animal kingdoms behave the way they do, two men in Europe looked at man's behavior in the same area. Swoboda, a psychologist at the University of Vienna and Fliess, a practicing physician in Berlin proposed theories circa the late 1800s on human behavior. 47

After collecting data for over twenty years, Fliess charted the fluctuations of attitudes and health<sup>48</sup> of these thousands of patients through reports of accidents. illnesses, marriages, divorces, etc. 49 These findings were published in the book The Relationship between the Nose and the Female Sex Organs from the Physiological Aspect. Fliess' breakthrough linked twenty-three and twenty-eight day cycles with changes in the mucosal lining of the nose. Fliess related nasal irritation to neurotic symptoms and sexual abnormalities.<sup>50</sup> Fliess stated that, "'Every person,

<sup>47</sup>Harold R. Willis, "Biorhythm Analysis" (a paper by the Director--Biorhythm Clinic, Missouri Southern State College, Joplin, Missouri, 1975), p. 1. 48 Ibid. <sup>49</sup> Stills. op. cit., p. 47. <sup>50</sup>Luce, Biological Rhythms . . . and Animal Physiology, op. cit., p. 8.

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I maintained, is really bisexual. Their component is keyed to the male cycle of 23 days, the female of a cycle of 28 days.'"51

Fliess also believed that these cycles were innate and would persist throughout the individual's existence. According to Fliess the two main cycles mentioned above were inherent in man and were measured by tracing diseases and deaths back to birth. 52

Fliess wrote about all his findings in the papers, "The Course of Life" in 1906, "Of Life and Death" in 1909, and "The Year of the Living" in 1925. According to Fliess, his intimate friend, Sigmund Freud, disclosed some of Fliess' ideas to Hermann Swoboda who published them as his own findings.<sup>53</sup>

In 1897 Swoboda began extensive research to follow up his observations of the philosopher Herbart's studies on the variations of humans' physical and emotional performances.<sup>54</sup> By 1902. Swoboda confirmed that what Fliess had stated about the twenty-three day physical cycle and twenty-eight day emotional cycle was also similarly

<sup>51</sup>Martin Gardner, "Mathematical Games," Scientific American, 215:1:108, July 1966.

<sup>53</sup>Gardner, op. cit., p. 109.

<sup>54</sup>Harold R. Willis, "Biorhythm and Its Relationship to Human Error," (proceedings of the Sixteenth Annual Meeting of the Human Factors Society, Santa Monica, California, October 17-19, 1972), p. 274.

accepted. 55 Swoboda dedicated much of the work at the University of Vienna to demonstrate that illnesses, heart attacks and deaths would occur on periodic and halfperiodic days, calculated according to the physical and emotional cycles. Swoboda performed computations with a slide rule that was designed specifically for biorhythms. All his findings were reported in the paper, "The Periodicity in Man's Life,"<sup>56</sup> and the book, Das Siebenjahr (The Year of the Seven).<sup>57</sup> Swoboda's book contained five hundred and seventy-six pages of statistical computations of the twenty-three and twenty-eight day cycles of generations. A great loss occurred in 1945 when the Russian troops confiscated the documents which to this date have never been recovered. 58

Both Swoboda and Fliess used mathematics in an effort to prove rhythmicity of the physical and emotional cycles.

The irony of their quest was that this very use of mathematics helped largely to defeat their attempts to gain wide acceptance for the very conclusions that mathematics helped them to reach. 59

<sup>55</sup>Willis, "Biorhythm Analysis," loc. cit. <sup>56</sup>Jean Mackenzie, "How Biorhythms Affect Your Life," Science Digest, 74:2:20, August 1973. 57Gardner. op. cit., p. 111.

cit.

59 Thommen, op. cit., p. 24.

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<sup>58</sup>Willis, "Biorhythm . . . to Human Error," loc.

<sup>&</sup>lt;sup>52</sup>Thommen. op. cit., p. 12.

Two pioneers in biorhythmic statistics were Frueh, a Swiss and Judt of Bermen, Germany. Frueh developed a vertical graph in which the positive phases of the cycles were designated by the following colors: red for the physical cycle, blue for the emotional cycle and green for the intellectual cycle. The negative phases of all the cycles were not indicated by color. In 1939, Frueh published books explaining the biorhythmic calculations and statistical tools used. 60

Judt, a doctor of engineering and mathematics in the 1920s, investigated the performances of athletes in sports. This researcher designed tables which demonstrated the significance of the date of birth to the day of the sports events.<sup>61</sup>

The sine curve model was first designed in the 1950s. By using this type of instrument, relative changes in all cycles can be observed on a daily basis. Calculators of a dial type have also been used; however, the sine curve charting was the most commonly used today.<sup>62</sup>

A third cycle called the intellectual cycle was added by the modern Fliessian cult.<sup>63</sup> Teltscher of the University of Innsbruch, Austria in the 1920s recorded

> <sup>60</sup>Ibid., pp. 29, 45. <sup>61</sup>Ibid., p. 28. <sup>62</sup>Ibid., p. 45. 63 Gardner, loc. cit.

this third cycle which consisted of thirty-three days.<sup>64</sup> Teltscher studied five thousand high school and university students to determine whether there was a pattern of dullness and alertness.

His charts corroborated the Fliess twenty-three day and twenty-eight day cycles, but also found a thirty-three day intellectual cycle of memory, alertness and reasoning powers. 65

Hersey, a psychology professor, along with Bennett, an endocrinologist at the University of Pennsylvania, conducted research in 1928 and 1932 on workers in railroad shops.<sup>66</sup> "Daily records were kept of their conversation, mood, outlook, physical condition, and work efficiency." These researchers saw a fluctuation of ability of thirtythree days. In later studies of Hersey, reports of patterns of four to six week rhythms of emotional fluctuations were observed. All these findings were in Hersey's books, Workers' Emotions in Shop and Home and Zest for Work.<sup>67</sup> A fourth cycle that has been recently used in biorhythmic statistics has its origins from all the previous cycles mentioned. A statement from Biorhythm Information

in 1973 explains the validity of this new cycle.

64 Thommen, op. cit., p. 55. 65<sub>Still</sub>, op. cit., p. 48. 66 Mackenzie, loc. cit.

(paper presented to the Third Community College Social Science Association Convention, Chicago, Illinois, November 1-3, 1973), p. 3.

67 Harold R. Willis, "The Effect of Biorhythm Cycles"

We are now feeling the necessity of extending our researches farther afield and conducting them into so called 'pattern analyses,' that is the analysis into patterns and combinations of three rhythms. In practical field, it is far more important and useful to learn the meanings of the plusperiods of each rhythm and to make the most of its benefits than to make researches only concerning with the critical days or periods.<sup>68</sup> [sic]

The most recent of books written on the biorhythm theory in 1975, called Biorhythms: How to Live with Your Life Cycles, by Barbara O'Neil and Richard Phillips, explains and demonstrates this new "cycle." These authors call this fourth cycle the composite. O'Neil and Phillips explain the cycle as ". . . both a refinement and a further explanation of the biorhythm chart. The composites offer a significant view of changes in energy levels."69

For the composite, the type of personality toward which one leans must be known. Phillips developed nine questions to determine whether the person was more the emotional, intellectual or physical type. Therefore, through algebraic calculations, a single line was developed from all three original cycles. By this means, the cycle predicts the personality types of the individual.<sup>70</sup>

The use of the discovered theories of the original three biorhythms (emotional, physical, intellectual)

69 Barbara O'Neil and Richard Phillips, Biorhythms: How to Live with Your Life Cycles (Pasadena: Ward Ritchie Press, 1975), pp. 21, 60.

<sup>70</sup>Ibid., pp. 14-15, 72, 74.

accomplished most of its development and improvement mainly

in Europe and Japan.

The Biorhythmic Center Basel, Basle, Switzerland states; 'Analysis at the Swiss Federal School of Technology, Zurich, Switzerland, have confirmed the natural regularity of the sequences . . .' The statistical analysis and verification of biorhythm was done by Prof. Dr. H. L. LeRoy, at the Laboratorium for Biometric and Populations genetic.<sup>71</sup>

However, today biorhythms are demonstrated to consist of three natural cycles and one more cycle determined by the algebraic sum of the three original cycles. These four cycles make up the biorhythm theory of today.

Each cycle was unique and different from the other cycles in periodic number of days and behavior pattern fluctuations. The basic characteristics of each cycle are as follows:

# Physical Cycle

This cycle is also referred to as the male cycle. It controls the masculine characteristics of ". . . physical strength, confidence, aggressiveness and endurance."72 According to Fliess, this cycle is initiated by the motor cells of the skeletal muscles. 73

> <sup>71</sup>Willis. "Biorhythm Analysis," loc. cit. <sup>72</sup>Gardner. op. cit., p. 112. <sup>73</sup>Thommen, op. cit., p. 51.

CHARACTERISTICS OF THE CYCLES

<sup>&</sup>lt;sup>68</sup>Ibid., p. 9.

The physical cycle is divided into half periodic phases of eleven and one-half days each. The first phase of the cycle is known as the ". . . ascending or discharge period." During this period, the individual feels and performs his/her best. <sup>74</sup> An athlete should do intensive training during this phase. 75

The recharging period constitutes the second half of the cycle. Physical energy and endurance is at a low point and the individual is more susceptible to tire easily. Discounting this effect of the negative position on conditioned athletes, Thommen states that,

All other things being equal, a trained athlete can succeed even during a recuperative period if he has not overtrained prior to the contest. 76

### Emotional Cycle

Sensitivity is the key to this cycle and so it is sometimes referred to as the female or sensitivity cycle. The cycle characterizes ". . . feelings, intuition, creativity, love, cooperation, cheerfulness."<sup>77</sup> Therefore, the physical cycle ". . . seems to influence not only your emotional outlook but your reactive ability as well."78

> 74<sub>Thid</sub> 75<sub>Mackenzie, op. cit., p. 19.</sub> 76 Thommen, loc. cit. <sup>77</sup>Gardner, loc. cit. <sup>78</sup>0'Neil, op. cit., p. 7.

According to the Japanese, any type of contest or public display and teamwork would be at its highest degree of efficiency for the individual at the peak of this cvcle. 79 Twenty-eight days was the length of the emotional

cycle.

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. . . The 28-day rhythm is composed of four seven-day weeks, the weekday that one was born on will always repeat on the first and on the fifteenth day of this rhythm.<sup>80</sup> Laird stated in 1935 that emotional energy is Correlations of the emotional cycle to the lunar

expanded and replenished in "regular" cycles running between four to five weeks. Laird said that this emotional energy could be demonstrated as being high when the individual had restless sleep and low when the individual slept well.<sup>81</sup> month and also the female menstrual cycle have been observed.<sup>82</sup> In the seventeenth century, Sanctorius, a physician, originated the theory that there was a resembling menstrual cycle in the male. Sanctorius based his theory on findings that the male fluctuated in weight from one to two

pounds in similar monthly cycles as those found in females.<sup>83</sup>

<sup>79</sup>Willis. "Biorhythm Analysis," op. cit., p. 3. 80 Thommen, op. cit., p. 53. <sup>81</sup>Donald A. Laird, "The Secret of Your Ups and Downs," Reader's Digest, 27:15-16, August 1935. <sup>82</sup>Hans J. Wernli, Biorhythm (New York: Crown Publishers, Inc., 1961), p. 19. <sup>83</sup>Mackenzie, op. cit., p. 20.

A study was performed by Hersey demonstrating the emotional fluctuations found in the male.

His conclusion was that although the emotional cycles of individual men vary with the individual from sixteen days to sixty-three days, the average length for men is about five weeks.<sup>84</sup>

As in the physical cycle, the emotional cycle is divided into half periods. An individual is more outgoing and happy during the discharging periods of the first fourteen days of the cycle.<sup>85</sup> The second half of the cycle is the recharging phase in which the individual is more impressionable to irritations or stressful situations. 86

The emotional cycle was not to be confused with the woman's menstrual cycle.

The female of our species also has an emotional cycle of approximately five weeks, but hers is complicated by two other cycles . . . [menstrual] and a fourteen day cycle of amorousness.

This proclivity of sexual desires was discovered in the 1930s by Marie Stopes.<sup>87</sup>

#### Intellectual Cycle

The most recent of the three original biorhythm cycles is the thirty-three day intellectual cycle. "Teltscher's associates and also certain doctors ascribed

> <sup>84</sup>Dewev, op. cit., p. 39. <sup>85</sup>Thommen, loc. cit. 86<sub>Mackenzie</sub>, op. cit., p. 14. <sup>87</sup>Dewey, op. cit., pp. 41-42.

In 1945, Hersey and Bennet, endocrinologists, demon-

the phenomenon to a secretion of the thyroid gland." Origin of the cycle is believed to be found in the brain cells.<sup>88</sup> strated the prevalence of a "change of mood rhythm" lasting thirty-three days. Rostant, a French scientist, stated that intellectual abilities are predetermined by the "'. . . 9,000,000,000 pyramidal cells in the cerebral cortex . . . "" According to Rostant, these pyramidal cells develop from a thirty-three cell division of a single cell.<sup>89</sup>

The first half period of sixteen and one-half days is the discharging phase. The characteristics are demonstrated through the individual's ability to memorize and respond more easily than during the recharging phase of the second half period.<sup>90</sup> The discharging phase of this cycle. according to the Japanese, should be used by the individual to venture into business experiments, discussions, decisions, studies demanding memorization and examinations.<sup>91</sup> Thommen has found ". . . that the 33-day intellectual rhythm has a minor, or at least only a contributory influence on human error, accident, or death."92

> <sup>88</sup>Thommen. op. cit., p. 55. <sup>89</sup>Wernli, op. cit., p. 92. 90 Thommen, loc. cit. <sup>91</sup>Willis. "Biorhythm Analysis," loc. cit. <sup>92</sup>Thommen, op. cit., p. 31.

### Composite Cycle

In 1975, Phillips presented a new method of design which demonstrates a general representation of the combination of the three previous cycles. ". . . The composite represents the algebraic sum of values assigned to each day of each cycle." General personality types can be found by administering nine questions developed by Phillips. The results of these questions divides the individuals into four categories (physical, intellectual, emotional and average personality classes). These categorizations are determined by the individual selecting one of the three answers designated by A, B or C of each question. If the individual chooses at least five answers from one of the three categories, this person is considered as having the characteristics of that particular personality type. "Other combinations mean you are average with a tendency toward the category where most of your choices lie." Through use of the table from O'Neil and Phillips, a single line can be developed from the mixtures of the three original rhythms. Therefore, it can possibly show the amplitudes of the high and low phases of the total behavior of the individual.<sup>93</sup>

### Critical Phase

Critical days occur in each of the three cycles and can be compared with the blowing out of an electric light

<sup>93</sup>O'Neil, op. cit., pp. 14-15, 74.

bulb. The explosion is caused because of a weakened filament that can not take the charge of the current being turned on or turned off. 94

The critical day, also known as the switch-point day, periodic or half periodic day, is that point when the curve crosses the midline from positive to negative or negative to positive. This phase in the cycle ". . . presents a brief moment of equilibrium with no stress, and at this point people are accordingly, most vulnerable."95 According to Thommen, susceptibility to accidents, illnesses or errors can be increased if two or all the cycles are at the critical point. Thommen et al. found that the potential for error and accident was definitely increased whenever the physical critical day coincided with another critical cycle. These double critical mixtures occur six times a year.<sup>96</sup> Once a year all three cycles

are at zero.97

There appears to be little agreement concerning what constitutes the critical days. The three theories are as follows:

<sup>94</sup>Thommen, op. cit., p. 57. 95Willis, "The Effect of Biorhythm Cycles," op. cit., p. 15. 96 Thommen, op. cit., p. 53.

<sup>97</sup>Willis. "The Effect of Biorhythm Cycles," op. cit., p. 3.

1. Mackenzie and Thommen believed that the critical days occur only at the beginning, midpoint and ending of each cycle. In other words, only when the cycle crosses the horizontal line does a state of flux exist <sup>98</sup> during the twenty-four hour span.<sup>99</sup> These days occur approximately once every six days. 100

2. Ault, Kincade and Willis proposed another view on the duration of the critical phase. According to Ault and Kincade, the critical phase was

'. . . the time which includes the day, and a 12 hour period either side of the day during which the curve or curves cross the zero line . . . 101

Willis stated that a high percentage of accidents, flare-ups and intellectual mishaps happen within the twenty-four hour switch point period or ". . . very near to it, for the particular cycle involved."<sup>102</sup>

3. The third viewpoint, held by Wernli and Anderson, agreed with the hypothesis held by Mackenzie and Thommen. However, Wernli and Anderson postulated that a critical potential could also exist when any two or more

98<sub>Mackenzie, op. cit., p. 19.</sub>

99 Thommen, op. cit., p. 58.

100<sub>Mackenzie</sub>, loc. cit.

101 Willis, "Biorhythm . . . to Human Error," op. cit., p. 280.

102Willis, "The Effect of Biorhythm Cycles, loc. cit.

cycles crossed at points in the regenerative phase other than the midline. 103 and the closer to the midline, the more critical the potential could be. 104

**RELATED STUDIES** 

Investigations have been performed in Japan, Europe and the United States to determine if biorhythmic critical days were a major factor in the cause of accidents, illnesses or individual human errors. In Europe, the practice of using the biorhythm theory to increase efficiency and reduce personal injury and error has been used guite extensively in air and land traffic services, athletics and by the medical profession. 105

The first use of biorhythmic statistics in business was accepted in Japan in the late sixties. The Omi Railway and Transportation Company of Hikone, Japan used the biorhythm theory to reduce the accidents of their bus drivers. ". . They reported that they reduced their accident rate to almost zero in one year, and had achieved 2,000,000 kilometers without an accident . . . " The company claimed this reduction as a result of telling the employees of the critical days.<sup>106</sup> A study in German factories using

104 O'Neil, op. cit., p. 54. 103<sub>Wernli. op. cit., p. 18.</sub> <sup>105</sup>Arehart, "Biorhythm . . . to Spot Accident Prone Periods," op. cit., p. 101.

<sup>106</sup>Willis. "The Effect of Biorhythm Cycles," op. cit., p. 1.

biorhythmic statistics revealed that the critical day was the site of eighty-three percent of the accidents.<sup>107</sup>

In the 1960s in the United States. Anderson investigated accidents that occurred in industry. The findings showed that seventy percent of over three hundred accidents that occurred coincided with the individual's critical day. In a second investigation between 1970 and 1972, ninety percent of one thousand cases of accidents studied fell on the critical day. 108

Willis researched in the areas of industry, traffic control and athletics. In Willis' studies, biorhythms had been found to be a significant factor in the cause of accidents, deaths and results of athletic contests.

The most recent research conducted in the United States was by Dr. Douglas E. Neil of the Naval Postgraduate School in California and the United States Air Force. Neil's research of the significance of human performance and biorhythms

. . . involving analysis of accident claims, indicated that such a relationship does exist and is significant in terms of the low phase and the critical day.

107 Rose Mary Rummel, "Individual and Team Biorhythms and Performances in the 1975 AIAW National Basketball Championships," 1975 (Madison College, Harrisonburg, Virginia), p. 2.

<sup>108</sup>0'Neil. op. cit., p. 53.

109Willis. "The Effect of Biorhythm Cycles," op. cit., p. 2.

However, to find out how each of the cycles related to actual performance. Neil conducted a controlled investigation on an information-processing task.

Analysis revealed that of fourteen observed cycle changes, nine fell within one day of the critical times in one of the biorhythmic cycles. 110

United Airlines in 1973 worked with Neil in an investigation of employees' accidents and errors. The employees were made aware of their biorhythmic critical days for a three-month period. According to United authorities, there was a reduction of injuries. It was also found that pilots were less influenced by the critical days (probably because of the intensive training), while the maintenance crews were more sensitive to these periods.

The Air Police at Kasuga Base in Japan reported in 1970 that through their research investigations, biorhythms proved to be very reliable. Out of one thousand and sixtysix self-caused cases, fifty-nine percent were on critical days. In three hundred and fifty-five cases in industry, critical days showed fifty-nine percent reliability. In the aerospace accident reports, out of seventy-two cases, sixty-seven percent occurred on critical days.<sup>112</sup> In medicine, evidence has been gathered to substantiate the relationship between deaths and the regenerative

> 1100'Neil, op. cit., pp. 57-58. 111 Ibid., pp. 59-60. <sup>112</sup>Willis, "Biorhythm Analysis," loc. cit.

phase of the physical cycle and the critical days of all the cycles.

It has also been found that medication or other medical treatment may be imposed which prevents the person from expiring during a critical or negative period. 113

Therefore, the probability that the percentage of deaths on critical-negative phases would be much higher if medical science was not used to help increase the life of the patient.

Not many research investigations on biorhythms and athletic performance have been written after the first book was published on Biological Rhythms and Performances in Sports in the 1920s by Judt of Germany.<sup>114</sup> A reason for a lack of interest in this area could be attributed to the insignificance of the biorhythmic statistics to performances of the athlete. O'Neil and Phillips stated in the book, Biorhythms: How to Live with Your Life Cycles, that

Athletes' concentration on training and conditioning, and on finding and maintaining the game face--that intangible quality of being properly susceptible to the extremes of biorhythmic influence.115

However, in the past five years more research has begun both in individual and team biorhythmic performances. 116

> <sup>113</sup>Willis, "Biorhythm . . . to Human Error," op. cit., p. 276. <sup>114</sup>Thommen, op. cit., p. 28. <sup>115</sup>0'Neil, op. cit., p. 36. 116<sub>Rummel, op. cit., pp. 2-3.</sub>

Many examples of sport figures have been biorhythmically charted in the three available books on biorhythms by O'Neil and Phillips, Wernli and Thommen. From the chartings, many showed significance of the critical days and high and low phases to failures and successes of the athlete's performance.

Examples of this are Lauer losing in the steeplechase in 1959. Lauer was charted as being in a critical physical stage. Connolly, in the 1960 Olympics in the hammer throw, lost by a large margin of his own previous world record. He was at a triple critical period. 117 Palmer, who had won the British Open in 1962, was in a triple high phase during this tourney. Palmer met failure a few weeks later in the PGA Tournament. According to the biorhythm chart, Palmer was at the triple low phase

during this week of play. 118

In boxing, there appears to be a high correlation between biorhythms and the performances of the boxers winning the bouts. In the fights between Patterson and Johansson in 1960, the biorhythms could have been used as predictors of the winner in all fights except the final fight. However, Johansson, who lost even though the biorhythm chart showed greater efficiency than Patterson's, stated that he had not trained right before his bout. 119

> 117<sub>Wernli, op. cit., pp. 102, 125.</sub> 118<sub>Thommen</sub>, op. cit., pp. 89-90. <sup>119</sup>Ibid., pp. 90-93.

Spitz displayed performances "when a man can do no wrong" at the 1972 Olympic Games in swimming. Spitz was in a discharge phase in both his physical and emotional cycles during the Olympic competition. 120

In O'Neil and Phillips' book, they gave examples of biorhythmic charting of athletes that showed little or no significance to biorhythms and performance.

A comparison of the charts for Jesse Owens, Olga Korbut, and Muhammad Ali indicates that critical days and lows do not guarantee mistakes or failure; the charts for Johnny Miller, Billie Jean King, and George Foreman show that highs do not necessarily mean success. We must keep in mind that in all these equations, training is crucial, and a certain amount of circumspection in interpretation is needed to allow for its effects.121

Out of this investigator's search of literature on studies of athletic performance and its relativity to biorhythmic statistics, only six studies from four different sport areas were considered relevant to this investigator's area of research. These studies are discussed briefly in the following paragraphs.

In the sport of football, two studies were found by this investigator. The results of games in 1972 and 1973 in the college and professional football teams were investigated by Wallerstein and Roberts of California. By

120 Willis, "The Effect of Biorhythm Cycles," op. cit., p. 9.

<sup>121</sup>O'Neil, op. cit., p. 47.

combining individual biorhythm cycles into team cycles, Wallerstein and Roberts predicted performances of the offense and defense. 122

The study "Predictive Powers in Bio-Rhythm Analysis in the Performance of Football Players" by Case at Missouri Southern State College in 1973 showed the application of biorhythmic statistics to predicting performances in football at Missouri Southern State College. The findings of this study demonstrated that of three hundred and fiftyfive games, one hundred and forty-two ran congruent to the predicted scores. Of the true performance scores, one hundred and thirty-one of these scores were better than the predicted scores. Eighty-two of the true performance scores were worse than the predicted scores. The predicted scores showed seventy-seven percent being equal to or better than the ranked performances established by the coach. 123 The evaluation of performances for the offense and defense of the football team was near a ninety percent preciseness.124

In the sport of gymnastics, Gunthard, the Swiss National Gymnastics Coach used biorhythmic statistics at

122<sub>Rummel, op. cit., p. 3.</sub>

123 Jann Case, "Predictive Powers in Bio-Rhythm Analysis in the Performance of Football Players," (paper presented to Missouri Southern State College, Joplin, Missouri, 1973), p. 1.

124 Willis, "The Effect of Biorhythm Cycles," op. cit., p. 8.

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the World Championships in Ljubljana. Gunthard predicted that his team would win twenty-four points. The Swiss team won, in reality, eighteen points. Two points were lost due to an injury (which occurred on this gymnast's critical physical day). Gunthard's prediction demonstrated eightytwo percent accuracy.<sup>125</sup>

Swimming was the next area in which two studies were read by this investigator. The first study was conducted on the Rochester Swim Club by Herring. Four groups of forty male swimmers were investigated. Group A was allowed to review their biorhythm charts prior to each day. In Group B, only the coach was allowed to see the charts before each day. Group C swimmers and not the coach were allowed to see their charts prior to each day. Group D's biorhythmic charting was not calculated until the end of the season. The physical cycle demonstrated the most influence on the times with the emotional cycle showing significance too. "On all swimmers tested, the practice times followed the biothythm curves with 90 percent accuracy. The meet times followed the curves with sixty percent accuracy."<sup>126</sup>

The second study investigated in the area of swimming was conducted in 1975 at Appalachian State University in Boone, North Carolina by Larson and Thomas. These

125<sub>Ibid</sub>.

126<sub>Vincent F. Herring,</sub> "Biorhythm in Swimming," Swimming Technique, 8:3:75, October 1971. investigators predicted the top twelve swimmers of the 1975 Men's Southern Conference Swim Championships in five of the events. Twenty-five percent were predicted in the five hundred yard freestyle, fifty-eight percent in the two hundred individual medley, twenty-nine percent in the fifty yard freestyle, seventy-seven percent in the 400 yard individual medley and fifty-eight percent were predicted in the two hundred yard freestyle. The results found that the emotional cycle had a significant bearing on the proficiency of the prediction.<sup>127</sup>

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The final study reviewed by this investigator was in the sport of basketball. "Individual and Team Biorhythms and Performances in the 1975 AIAW National Basketball Championships" was the subject of investigation by Rummel of Madison College in Virginia. Rummel's study contained two hypotheses. The first hypothesis was to compare the women's individual and team performances. The other hypothesis was to determine if injuries showed significance with a critical or negative phase to the day of the injury; however, no injuries occurred. Performances were taken from the game statistics and ranked good or poor according to seasonal averages. Overall, the results demonstrated approximately eighty-five percent of both the individual

127 E. Ole Larson and Ellen Thomas, "Prediction of Performance through Biorhythmical Charting" (unpublished study at Appalachian State University, Health, Physical Education and Recreation Department), Boone, North Carolina, November 1, 1975, pp. 19-20.

and team biorhythmic predictions as being related to individual and team performances. 128

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### SUMMARY OF RELATED LITERATURE

In reviewing the literature, two views of the origin of the "master controller" were described: the endogenous clock hypothesis and the exogenous clock hypothesis. 129 The subsequent literature dealt with the historical background of the biorhythm theory and the characteristics of the cycles. Studies in traffic services, medicine and athletics were described. The investigations made by the traffic services suggested that the employees should be forewarned of the critical days.<sup>130</sup> More accidents occurred on the employees' critical days than any other day of work.<sup>131</sup>

A lack of interest in the area of biorhythmic statistics and performances of the athlete suggested the rationale for only six recent studies performed on biorhythms and athletic performances. Five studies were reviewed in which the biorhythms were utilized to predict the final consequence of the contests. A large percentage

<sup>128</sup>Rummel, op. cit., pp. 4-5, 8.

129 Arehart, "The Search . . . to the Rhythms of Life," op. cit., p. 178.

130Willis, "The Effect of Biorhythm Cycles," op. cit., p. 1; see also, Willis, "Biorhythm Analysis," loc. cit.

131 Arehart, "Biorhythm . . . to Spot Accident Prone Periods," loc. cit; see also, O'Neil, op. cit., p. 53.

of the predictions were reported as significant in one or all of the three cycles. 132

One study utilized the biorhythm theory to influence the coach and players positively or negatively in practice and in competitive situations. Significance on performance outcomes was demonstrated in the physical and emotional curves. 133

132 Rummel, op. cit., p. 3; see also, Case, loc. cit.; see also, Willis, "The Effect of Biorhythm Cycles." loc. cit.; see also, Larson, loc. cit. 133 Herring, loc. cit.

#### Chapter III

#### PROCEDURES

This study was divided into four distinct subproblems: (1) selection of subjects and tournaments. (2) tabulation of the deviation of the golfer's daily golf scores from each individual's 1975 average score, (3) calculation and classification of each subject's physical, emotional, intellectual and mixed biorhythms, and (4) treatment of the data.

#### SUBJECTS AND TOURNAMENTS

Subjects were selected from the Ladies Professional Golf Association. Only the top twenty money winners of the year 1975 designated by the LPGA were considered for the purposes of this study.

A total of thirty-three official and unofficial tournaments were scheduled by the Ladies Professional Golf Association for the year 1975. However, the United States Open Tournament was deleted from the study because the daily scores were not given in the LPGA Player Guide 1976. Also, the Colgate European Ladies Open was eliminated because of

an error by the investigator in the final organization of the data. The total number of potential tournaments to be played by the twenty lady golfers was reduced to thirty-one. Each of the twenty lady golfers did not play in all of the thirty-one tournaments. The most tournaments played by any one golfer was twenty-six. The least tournaments played by any one golfer was seventeen.

#### DAILY DIFFERENTIAL

The 1975 final scoring averages for each golfer were taken from the LPGA Player Guide 1976. <sup>2</sup> Each golfer's rounded off average score was utilized by the investigator to determine the deviation from the mean of all daily golf scores played in competition. (See Appendix B, p. 80.) In golf the object of the game is to take as few strokes as possible in completing eighteen holes. Therefore, the lower the score, the better the golfer has performed. For the purposes of this study, a negative sign was given to the deviation number when the daily score demonstrated a lower numerical value than the mean score. A positive sign was given to the deviation number when the daily score demonstrated a higher numerical value than the mean score. The researcher also referred to these negative and positive signs as being below average and above average,

respectively.

<sup>&</sup>lt;sup>1</sup>Becky Madeira, ed., LPGA Player Guide 1976 (New York: LPGA Office, 1976), p.  $\overline{8}$ .

#### **BIORHYTHM CLASSIFICATION**

Each golfer's physical, emotional and intellectual cycles of the biorhythms were calculated by the Univac Seventy-Forty-Six computer at the Appalachian State University Data Processing Center. Data cards necessary for key punching consisted of four frontal cards, twenty subject cards and two sign-off cards. The card essential for dispatching computer execution of the selected program was the second frontal card. This card was demonstrated as /EXEC \$FAC.O.BIOR.

For each golfer, a data card was prepared which included the birthdate and name. Responding to the birthdates, the computer statistically printed out the three biorhythmic cycles according to each given day of the twelve months. Switch-point periods were distinguished on a daily basis by exhibiting plus and minus signs. (See Appendix C, p. 101.)

The mixed biorhythm was calculated by the investigator because the computer was not programmed for this rhythm. The investigator computed the mean of the three biorhythms (physical, emotional and intellectual) for a given day to determine the amplitude of the point on the mixed curve. Mixed rhythm points were calculated for each of the tournament days.

In classifying the three original cycles, the investigator used the conventional biorhythmic curve interpretation as stated by Thommen et al.<sup>3</sup> Three treatment groups were employed to distinguish average/above average biorhythmic efficiency, below average biorhythmic efficiency and the critical day of the four rhythms. These categories were demonstrated by the figures 1, 2, and 3. (See Appendix C, p. 101.)

The computer was only programmed to assign amplitude points for complete twenty-four hour days. The theorized critical day for the physical and intellectual cycles was demonstrated as being the eleven and one-half day in the physical cycle and the sixteen and one-half day in the intellectual cycle. Therefore, the exact critical day at the half periodic point for the physical and intellectual cycles was not recorded on the print-out by the computer. (See Appendix C, p. 101.)

Days above the periodic day, classified as average and above average biorhythmic efficiency, included: one through ten in the physical cycle, one through thirteen in the emotional cycle and one through fifteen in the intellectual cycle. The days classified as below average biorhythmic efficiency were exhibited as negative signs below the periodic day. This phase consisted of thirteen through twenty-two days in the physical cycle, fifteen through twenty-seven days in the emotional cycle and

<sup>3</sup>George S. Thommen, <u>Is This Your Day?</u> (New York: Crown Publishers, 1973). eighteen through thirty-two days in the intellectual cycle. (See Appendix C, p. 101.)

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The investigator did not determine the cycle of the mixed biorhythm. Therefore, the mixed rhythm was classified by positive and negative points in lieu of days. All points demonstrating a zero in two decimal places were rounded off to the nearest tenth for the purposes of determining the critical phase in the mixed rhythm. Using the above procedure, the points ranging from .000 through .049 were delimited to the critical phase of the mixed cycle. (See Appendix D, p. 162.)

## TREATMENT OF THE DATA

The organization and analysis of the data consisted of the distribution of the performance score deviations for each tournament day corresponding to the day of the three biorhythmic efficiency treatment groups. An analysis of variance for one-way design, program BMD.V.Ø1, was executed on the ninety/sixty computer at the Appalachian State University Data Processing Center.

The three treatment groups were (1) the average and above average biorhythmic efficiency group, (2) the below average biorhythmic efficiency group, and (3) the critical biorhythmic group. Separate ANOVAs were computed for the physical, emotional, intellectual and mixed rhythms.

The mean and standard deviation were found, along with an F-ratio, for the physical, emotional, intellectual and mixed cycles. These three components were analyzed to statistically test the null hypotheses.

#### Chapter IV

# PRESENTATION AND ANALYSIS OF DATA

The presentation and analysis of data were arranged according to the different biorhythmic cycles, namely, the physical cycle, the emotional cycle, the intellectual and the mixed cycles. Within each section were found descriptive statistics, analysis of variance for the one-way design and a graph displaying the mean deviations of golf scores for the individual cycle. Comparisons of the differences among the four biorhythmic patterns to the competitive performances of the three treatment groups (average/above average, below average and critical) of the top twenty money winners in the Ladies Professional Golf Association for the year 1975 were disclosed in the chapter.

#### PHYSICAL CYCLE

The mean for the average/above average index was .1667; for below average, the mean value was -.0082; and, for critical, .0333 was the mean. Observable differences in the treatment groups which may have occurred by chance were demonstrated. (See Table 1, p. 57.) The mean score Table 1

Descriptive Statistics of the Physical Cycle for Three Treatment Groups

Treatment Group	м	S.D.	Sample Size
1 (Average and Above Average Index)	.1667	2.8737	578
2 (Below Average Index)	0082	3.0278	608
3 (Critical Index)	.0333	2.5604	150

for treatment group one (average/above average performance) displayed a positive value which inferred poor performance instead of average/above average performance), the mean score displayed a negative value which inferred average or above average performance instead of below average performance. (See Graph 1, p. 58.) The differences among the treatment groups for the physical cycle failed to reject H1. Table 2 discloses the non-significant F-ratio of .5449. (See Table 2, p. 59.)

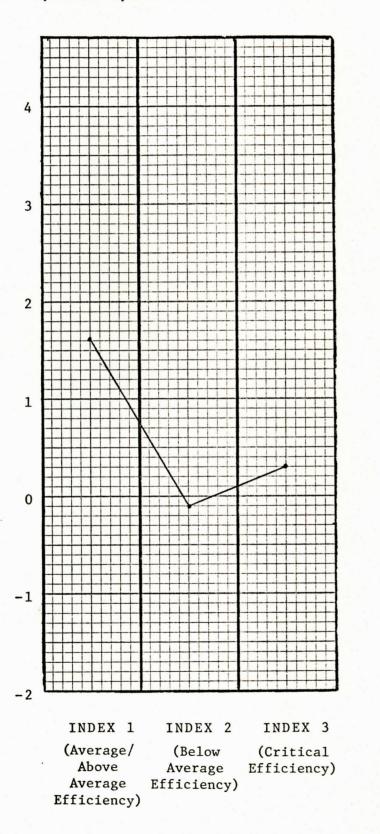
# Graph 1

Mean Deviations of Golf Scores from Golfer's Average for the Physical Cycle Indices

ABOVE AVERAGE SCORES (High Scores)

AVERAGE

**BELOW AVERAGE SCORES** (Low Scores)



Analysis of Variance of the Phys Performance Scores and Biorhy for Three Treatment

Source of Variation	SS	df
Between Groups	9.2452	2
Within Groups	11240.4530	1325
TOTAL	11249.6950	

\*An F-ratio of 2.99 required .05 level.

EMOTIONAL CYCL

Table 3 displayed a non-significant F-ratio of

2.6525 at the .05 level of confidence for the three bio-

rhythmic efficiency indices. (See Table 3 below.) The

# Table 3

Analysis of Variance of the Emotional Cycle of 1336 Performance Scores and Biorhythmic Potentials for Three Treatment Groups

Source of Variation	SS	df	MS	F	р
Between Groups	46.6518	2	23.3259	2.1	
Within Groups	11713.4530	1332	8.7939	2.6525*	N.S.
TOTAL	11760.1010	1334			

\*An F-ratio of 2.99 required for significance at the .05 level.

ical Cycl thmic Pote Groups		336
MS	F	р
4.6226		
8.4834	.5449*	N.S.
for signi	ficance	at the
2		

59

means for the average and above average index, the below average index and the critical index were as follows: treatment group one, -.1877, treatment group two, .1919 and treatment group three, .1375. (See Table 4 below.)

### Table 4

### Descriptive Statistics of the Emotional Cycle for Three Treatment Groups

Treatment Group	М	M S.D.	
l (Average and Above Average Index)	1877	2.9285	667
2 (Below Average Index)	.1919	3.0731	589
3 (Critical Index)	.1375	2.4064	80

Gross differences between indices one and two were demonstrated in Graph 2. Expected negative values for average/above average efficiencies and performance scores and positive values for below average and critical efficiencies and performance scores were observed in all three treatment indices for the emotional cycle. (See Graph 2, p. 61.) However, the investigator failed to accept the observation as being significant because of the nonsignificant F-ratio. (See Table 3, p. 59.)

#### INTELLECTUAL CYCLE

A non-significant F-ratio of .5239 was obtained among the three indices. The result denoted that no

Graph 2

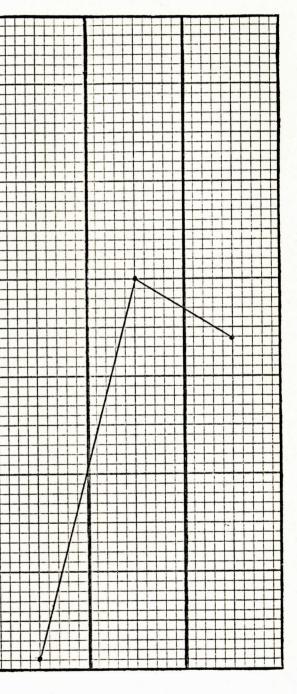
Mean Deviations of Golf Scores from Golfer's Average for the Emotional Cycle Indices

(High Scores)

ABOVE AVERAGE SCORES

AVERAGE

BELOW AVERAGE SCORES (Low Scores)



INDEX 1

0

-1

INDEX 2

INDEX 3

(Average/ Above Average Efficiency)

(Below Average Efficiency)

(Critical Efficiency) differences existed between intellectual biorhythmic efficiency and performance scores. (See Table 5 below.) The

### Table 5

### Analysis of Variance of the Intellectual Cycle of 1336 Performance Scores and Biorhythmic Potentials for Three Treatment Groups

Source of Variation	SS	df	MS	F	P
Between Groups	8.9127	2	4.4564		
Within Groups	11339.2810	1333	8.5066	.5239*	N.S.
TOTAL	11348.1910	1335			4

\*An F-ratio of 2.99 required for significance at the .05 level.

means for the three indices were .1168, -.0288, and -.1092, respectively. These three indices were demonstrated in Table 6 below. Differences of the treatment indices

### Table 6

### Descriptive Statistics of the Intellectual Cycle for Three Treatment Groups

Tı	reatment Group	М	S.D.	Sample Size
1	(Average and Above Average Index)	.1168	2.8938	591
2	(Below Average Index)	0288	3.0059	626
3	(Critical Index)	1092	2.5237	119

(average/above average index, below average index and critical index) disclosed visual inversed distinctions; therefore, the investigator accepted H<sub>3</sub>. (See Graph 3,

p. 64.)

MIXED CYCLE

The rhythm that evolved from the mathematically

averaged biorhythms displayed -.0394, .0776, and .4554 for the means of the average/above average index, the below

average index, and critical index. (See Table 7 below.)

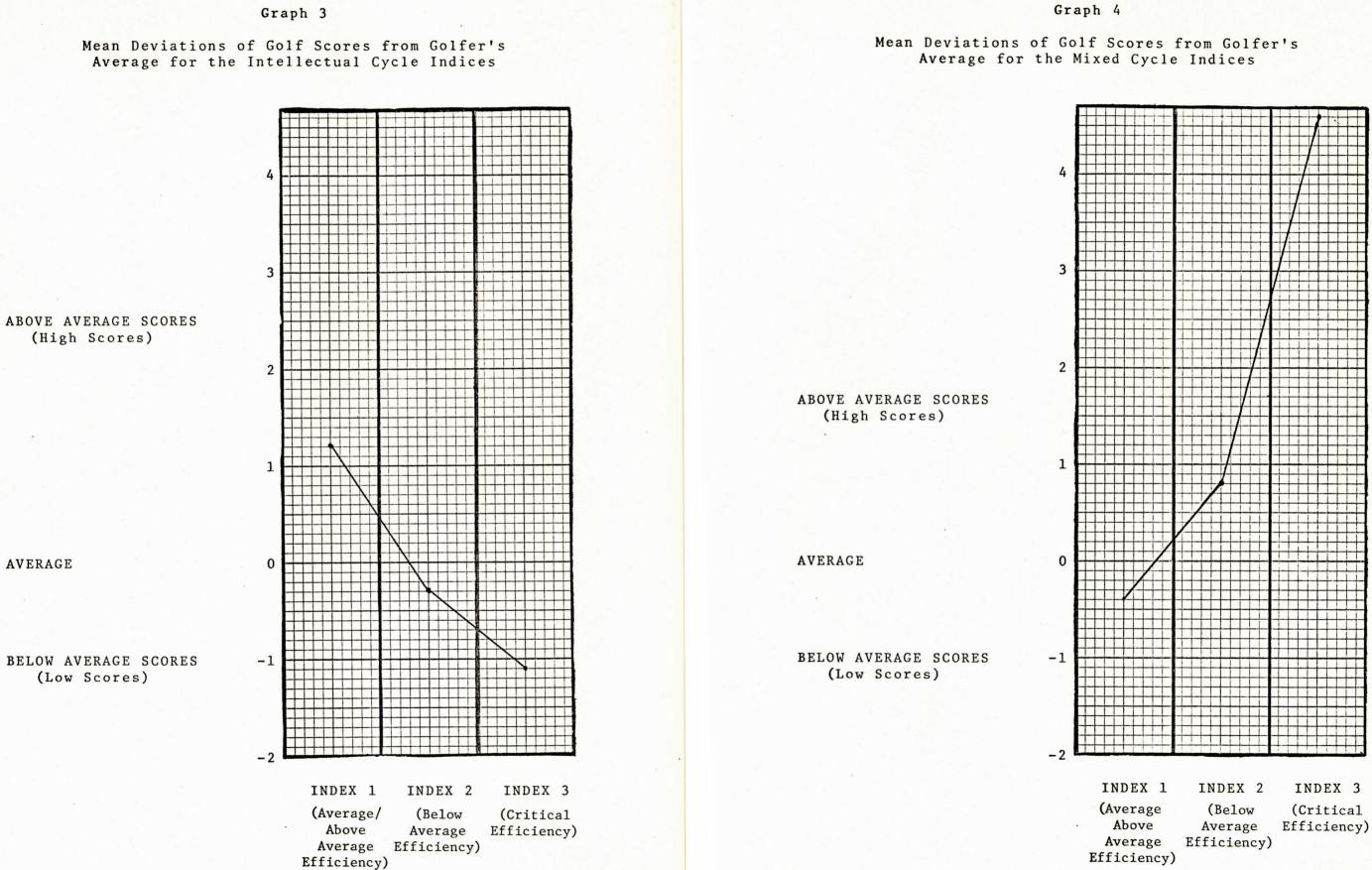
Table 7

# Descriptive Statistics of the Mixed Cycle

Treatment Group	Group M S.D.		
1 (Average and Above Average Index)	0394	2.8395	635
2 (Below Average Index)	.0776	3.0029	589
3 (Critical Index)	.4554	2.9344	112

The analysis of the data for the mixed rhythm revealed an observable expected similarity of the treatment groups according to the conventional interpretation of the positive and negative phases of the biorhythmic curves. The third treatment index (critical phase) demonstrated an observable expected deviation from the second treatment group according to the conventional critical point interpretation. (See Graph 4, p. 65.) However, a non-significant F-ratio of 1.4016 was obtained as designated in Table 8, p. 66.

for Three Treatment Groups



Efficiency)

### Table 8

Analysis of Variance of the Mixed Cycle of 1336 Performance Scores and Biorhythmic Potentials for Three Treatment Groups

Source of Variation	SS	df	MS	F	р
Between Groups	23.9000	2	11.9500		
Within Groups	11288.6790	1324	8.5262	1.4016*	N.S.
TOTAL	11312.5780	1326			

\*An F-ratio of 2.99 required for significance at the .05 level.

Chapter V

SUMMARY, FINDINGS, DISCUSSION OF THE FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS

### SUMMARY

The primary purpose of the study was to ascertain if there was a significant difference between performance scores and biorhythm efficiencies (average/above average phase, below average phase and critical phase) of the top twenty lady golfers. The computations were analyzed according to the conventional method of interpreting the biorhythm theory through the one-way analysis of variance. The subjects consisted of the 1975 top twenty money winners of the Ladies Professional Golf Association. The golfer's original biorhythms (physical, emotional and intellectual cycles) for the year 1975 were computed from the individual's birthdate. The fourth cycle, the mixed cycle, was computed by calculating the average of the three original biorhythms for the given day. Daily performance scores were gathered from thirty-one tournaments for the year 1975. Each golfer's daily score was classified according to the deviation from the individual's 1975

performance score average.

The differences of the four biorhythmic cycles to golf performance scores were computed by the one-way analysis of variance. The F-ratios, computed for the three treatment groups (average/above average, below average and critical indices), of each cycle was analyzed to determine if there was a significant difference between performance scores and biorhythms.

### FINDINGS

The findings of this study were as follows: 1. There was no significant difference among the treatment groups of the physical cycle according to the conventional biorhythm theory analyzed by the one-way analysis of variance.

2. There was no significant difference among the treatment groups of the emotional cycle according to the conventional biorhythm theory analyzed by the one-way analysis of variance.

3. There was no significant difference among the treatment groups of the intellectual cycle according to the conventional biorhythm theory analyzed by the one-way analysis of variance.

4. There was no significant difference among the treatment groups of the mixed cycle according to the conventional biorhythm theory analyzed by the one-way analysis of variance.

5. As displayed by the four computations of Fratios, the analysis of variance disclosed non-significant differences among performance scores and biorhythmic efficiencies of average/above average, below average and critical according to the conventional biorhythm method of interpretation.

#### DISCUSSION OF THE FINDINGS

It was the assumption of the study that one or all biorhythmic cyclic potentials would affect the performance scores of the lady golfers to a significant degree. However, the results of the study failed to reject the hypotheses at the .05 level of confidence for the physical, emotional, intellectual and mixed cycles.

Two factors must be considered in the findings of the study. An initial consideration that was not determined was the personality of each golfer. Interpretations of biorhythms should have entertained distinctions of not only introversion and extroversion, but also age and health. Another constituent that should have been deliberated was the nature of the sport. The game of golf required outside play; therefore, the golfers were constrained to subdue the environmental inclemencies.

<sup>1</sup>Barbara O'Neil and Richard Phillips, <u>Biorhythms:</u> How to Live with Your Life Cycles (Pasadena: Ward Ritchie Press, 1975), p. 47.

Unlike Thommen's book, O'Neil and Phillips discussed the failures of biorhythmic predictions in athletics:

. . . Critical days and lows do not guarantee mistakes or failure . . . and highs do not necessarily mean success. We must keep in mind that in all these equations, training is crucial, and a certain amount of circumspection in interpretation is needed to allow for its effects.<sup>2</sup>

Kitchens stated that the conventional biorhythm theory, based on the sine curve equation y = sine x, was an inaccurate instrument for distinguishing varying biorhythmic efficiencies. Kitchens posited there was a more appropriate equation for explaining the amplitudes of the biorhythm theory. According to Kitchens, compact fluctuations at the midline would demonstrate a separation of the sine curve. This junction would explain the critical phase of the cycles and would be more conducive to the interpretation of the biorhythm theory.<sup>3</sup>

The performance scores did not display a significant deviation from zero (average performance) to reject the null hypotheses. The investigator concurred with O'Neil and Phillips that the athletes' concentration during competitive situations ". . . tends to make them as a group less susceptible to the extremes of biorhythmic influence.<sup>4</sup>

<sup>2</sup>Ibid.

<sup>3</sup>Statement by Larry Kitchens, Assistant Professor of Mathematical Sciences, personal interview, Appalachian State University, Boone, North Carolina, July 26, 1976.

<sup>4</sup>0'Neil, op. cit.

CONCLUSIONS

The following conclusions were drawn from the study: 1. A review of current literature indicated that intrinsic and extrinsic variables may have influenced the performance of the golfers enough to overwhelm the potential outcomes of the biorhythms.

2. The results of the study, analyzed by utilizing the analysis of variance for one-way design, inferred that the four rhythmic cycles did not have a significant effect on the performances of the top twenty lady golfers.

#### RECOMMENDATIONS

The following recommendations were proposed: 1. To conduct case studies on the top twenty money winners of the Ladies Professional Golf Association and take into consideration health, age and personality. 2. To conduct a similar study utilizing the composite cycle developed by Phillips. 3. To conduct a similar study employing nonprofessional golfers as the selected population for the study.

4. To conduct a similar study and control the variables of climatic conditions and difficultness of the golf courses on which the golfers played.

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# APPENDIX A

# 1975 Final Money List

Rank	Name
1	Sandra Palmer
2	JoAnne Carner
3	Carol Mann
4	Sandra Haynie
5	Judy Rankin
6	Jane Blalock
7	Donna C. Young
8	Kathy McMullen
9	Kathy Whitworth
10	Sandra Post
11	Suzie McAllister
12	JoAnn Washam
13	Carole Jo Skala
14	Pat Bradley
15	Amy Alcott
16	Jocelyne Bourassa
17	Betsy Cullen
18	Sue Roberts
19	Debbie Austin
20	Joyce Kazmierski

# APPENDIX A

....

# 1975 FINAL MONEY LIST

Total Money Won
\$94,805.20
\$80,119.72
\$72,350.56
\$65,895.03
\$74,347.81
\$64,673.40
\$58,100.05
\$41,984.36
\$53,603.15
\$47,015.60
\$37,829.04
\$40,529.29
\$33,545.04
\$46,684.32
\$33,256.98
\$29,252.36
\$27,919.05
\$27,573.61
\$22,062.77
\$35,435.92

Deviation from Golfer's Performance Score Average for C. Mann

Dates of	De	viation from	Average	(72)
Tourneys	1	2	3	
January 31-				
February 2	-1	-1	-1	
February 7-9	2	0	-3	
March 27-29	2	2	2	
April 17-20	1	0	-1	- ]
April 25-27	0	0	-1	
May 2-4	0	4	1	
May 23-25	1	-4	-3	
May 29 thru June 1	-1	5	0	(
June 6-8	5	1	0	
June 13-15	-1	0	2	
June 27-29	-3	4	-3	
July 4-6	4	1	9	
July 11-13	-6	-2	1	
July 25-27	-4	-6	0	
August 15-17	-3	-1	0	
August 22-24	-3	1	1	
September 5-7	-5	-2	-1	
September 19-21	9	1	4	
October 17-19	9	1	4	
November 14-16	7	8	5	
November 21-23	-1	0	-2	1
December 5-7	6	5	0	
December 13-14	4	4		

APPENDIX B

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DEVIATIONS FROM GOLFERS' PERFORMANCE

SCORE AVERAGES

# Deviation from Golfer's Performance Score Average for S. Palmer

Dates of		Deviation	from Average	
Tourneys	1	2	3	4
February 7-9	-2	-1	-1	
March 21-23	1	1	-1	
March 27-29	4	-1	- 4	
April 17-20	-3	-3	-3	0
April 25-27	-5	0	1	
May 2-4	-2	-1	-3	
May 9-11	2	-2	- 4	
May 23-25	-2	-1	-5	
May 29-June 1	1	-2	0	2
June 6-8	1	3	1	
June 13-15	1	1	-1	
June 20-22	-2	-2	-2	
June 27-29	1	2	0	
July 11-13	-3	-2	-1	
July 25-27	1	2	-2	
August 15-17	-2	-4	-1	
August 22-24	-1	1	0	
September 5-7	- 2	- 4	0	
September 12-14	-2	3	1	
September 19-21	2	4	2	
October 23-26	1	-2	1	2
November 14-16	6	5	2	
November 21-23	-1	1	. 1	
December 5-7	2	4	2	
December 13-14	1	3		

APPENDIX B-3

Deviation from Golfer's Performance Score Average for J. A. Carner

Dates of Tourneys	1	Deviation 2	from Average 3	(72)
February 7-9	2	4	-4	
February 21-23	-2	2	7	
March 27-29	-5	0	-1	
April 17-20	1	3	2	- ]
April 25-27	2	0	-3	
May 2-4	0	-7	1	
May 9-11	1	1	0	
May 23-25	-3	-4	-3	
May 29-June 1	1	5	2	- 2
June 6-8	-4	0	1	
June 13-15	6	5	2	
June 20-22	0	-1	-2	
June 27-29	1	-3	0	
July 11-13	-1	-1	-2	
July 25-27	-3	3	2	
August 15-17	-4	0	-2	
August 22-24	-3	0	-2	
September 5-7	0	2	-2	
September 19-21	4	3	8	
November 14-16	6	2	2	
November 21-23	-3	3	2	
December 5-7	2	1	5	
December 13-14	-2	0		

1.

# Deviation from Golfer's Performance Score Average for S. Haynie

		and the second		
Dates of		Deviation 2	from Average 3	(72)
Tourneys	1	2	3	4
January 31- February 2	0	1	-2	
February 7-9	-1	0	- 4	
March 27-29	1	-3	-3	
April 17-20	-2	4	3	0
April 25-27	-3	1	-2	
May 2-4	1	-2	1	
May 23-25	0	- 4	-1	
May 29-June 1	0	0	-1	2
June 13-15	6	-2	5	
June 27-29	-1	-2	2	
July 11-13	-4	0	0	
July 25-27	-1	1	0	
August 15-17	1	-3	1	
August 22-24	-4	-3	0	
September 5-7	-1	0	4	
September 19-21	-1	1	0	
November 14-16	3	-1	5	
November 21-23	-6	-1	1	
December 5-7	-2	3	4	

Deviation from Golfer's Performance Score Average for J. Rankin

Dates of		Deviation	from Average	
Tourneys	1	2	3	4
January 18-19	1	1		
January 31-				
February 2	-2	3	4	
February 7-9	2	0	3	
February 21-23	2	-1	0	
March 21-23	-1	3	2	
March 27-29	. 2	-5	2	
April 17-20	4	3	-1	- 2
April 25-27	-1	0	-3	2
May 2-4	-1	-6	1	
May 9-11	-1	3	5	
May 23-25	-6	-3	-1	
May 29-June 1	0	4	- 4	2
June 6-8	2	3	3	
June 13-15	- 2	3	2	
June 20-22	-1	-1	-2	
June 27-29	1	1	1	
July 11-13	-3	-1	2	1000
August 15-17	-3	2	-3	
August 22-24	-4	-4	-1	
September 5-7	-2	-1	3	
September 12-14	3	0	2	
December 5-7	0	0	3	
December 13-14	-1	-1		

# Deviation from Golfer's Performance Score Average for J. Blalock

Dates of Tourneys	1	Deviation 2	from Average 3	(73)
January 31- February 2	-3	-3	0	
February 7-9	0	-3	2	
February 21-23	-1	-5	3	
March 21-23	1	-1	-2	
March 27-29	-3	-2	-5	
April 17-20	-1	0	-3	1
April 25-27	-1	0	-2	
May 2-4	-6	-1	-1	
May 9-11	-3	0	4	
May 29-June 1	-2	2	4	
June 6-8	-2	5	1	
June 13-15	4	-1	3	
June 27-29	3	-1	0	
July 11-13	-4	-3	1	
August 22-24	-4	-1	-5	
September 5-7	3	1	1	
September 12-14	-1	0	1	
September 19-21	2	4	0	
November 21-23	-5	1	0	
December 5-7	. 0	1	0	
December 13-14	-2	-2		

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Deviation from Golfer's Performance Score Average for D. Young

		FIL GRANTALOWARD		
Dates of Tourneys	1	Deviation 2	from Average 3	(73)
January 31- February 2	-3	-2	-6	
February 7-9	-4	-2	-1	
March 21-23	6	1	-3	
March 27-29	1	-3	2	
April 17-20	1	1	0	
April 25-27	3	-6	- 2	
May 2-4	-4	-2	-2	
May 9-11	-1	-3	-1	
May 29-June 1	-1	-1	0	-
June 27-29	3	3	3	
July 4-6	0	4	-3	
July 11-13	2	0	-2	
August 15-17	-2	- 4	1	× .
August 22-24	-4	0	-1	
September 5-7	- 2	- 4	2	
September 19-21	-3	4	-1	
October 17-19	3	5	0	
October 23-26	2	-2	-3	
November 14-16	4	6	0	
November 21-23	-2	2	2	
December 5-7	0	1	9	

# Deviation from Golfer's Performance Score Average for K. McMullen

Dates of Tourneys	1	Deviation 2	from Average 3	(74)
January 31- February 2	-6	2	1	
February 7-9	-0	0	-4	
February 21-23	-2	-4	1	
March 21-23	7	-2	4	
March 27-29	3	0	-5	
April 17-20	-3	2	-8	- 3
April 25-27	-2	-7	2	
May 2-4	-3	1	1	
May 9-11	3	1	2	
May 23-25	-2	-1	-6	
May 29-June 1	0	2	4	-1
June 6-8	0	3	1	
June 13-15	0	4	4	
June 20-22	0	-6	-2	
June 27-29	0	-5	1	·
July 4-6	1	-2	-2	
July 11-13	-3	0	-2	
August 15-17	3	-2	2	
August 22-24	-3	-7	-1	
September 5-7	-3	3	1	
September 12-14	1	1	-3	
September 19-21	1	3	3	
October 17-19	4	3	6	
November 14-16	1	3	0	
November 21-23	5	-2	5	
December 5-7	2	2	1	

Deviation from Golfer's Performance Score Average for K. Whitworth

Dates of Tourneys	1	Deviation 2	from Average		4
January 18-19	-2	0			-
January 31- February 2	-1	-3	0		_
February 7-9	3	-5	1		-
February 21-23	-3	5	1		-
April 17-20	4	-4	1		6
April 25-27	2	1	3		-
May 9-11	-1	0	-2		-
May 23-25	0	-5	-3		
May 29-June 1	-3	-3	2		C
June 13-15	0	1	1		-
June 20-22	-4	3	-2		-
June 27-29	5	-2	-1		
July 25-27	-1	-6	1		_
August 15-17	0	-1	-3		-
August 22-24	-2	-3	-3		-
September 5-7	-1	4	-2		-
September 12-14	-1	-1	-4		-
September 19-21	2	2	3		-
October 23-26	6	-1	6	1	1
November 14-16	3	3	1		

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Deviation from Golfer's Performance Score Average for S. Post

Dates of Tourneys	1	Deviation 2	from Average 3		4
January 18-19	-1	2	1		
January 31- February 2	-2	-4	1		
February 7-9	-2	2	-5		
February 21-23	0	-7	- 4		
March 21-23	-1	1	3		
March 27-29	-1	0	- 4		
April 17-20	1	-2	-1		2
April 25-27	-1	-3	0		
May 2-4	-4	1	0		
May 9-11	6	1	4		-
May 23-25	-3	-3	0		
May 29-June 1	0	0	3		0
June 6-8	3	0	6		
June 13-15	2	4	5	1.344.5	
June 20-22	1	-2	- 5		
June 27-29	2	-2	1		
July 11-13	-2	-1	1		
July 25-27	-1	2	2		
August 15-17	0	-1	-1		
August 22-24	-1	0	- 4		
October 17-19	2	2	4		
November 14-16	1	4	0		
November 21-23	0	0	0		
December 5-7	2	3	5		

Deviation from Golfer's Performance Score Average for S. McAllister

Dates of Tourneys	1	Deviation 2	from Average 3	(74)	4
		2			4
January 1- February 2	-2	-3	-5		
February 7-9	2	-4	-3		
February 21-23	-2	-5	0		
March 21-23	-4	0	6		
March 27-29	-1	-1	-3		
April 25-27	-2	3	5		-
May 2-4	-2	-2	2		-
May 9-11	-2	-2	-1		
May 23-25	-2	1	1		
May 29-June 1	0	1	9		~
June 13-15	3	0	7		-
June 20-22	-2	-3	-1		
June 27-29	4	1	2		
July 4-6	-2	-4	- 4		
July 11-13	-2	0	0		
July 25-27	-2	-6	- 4		
August 15-17	0	2	-2		
August 22-24	-2	0	- 4		
September 5-7	-1	-3	0		
September 12-14	6	-3	2		
September 19-21	1	4	1		
October 17-19	4	0	3		
October 23-26	1	2	- 4		1
November 14-16	5	3	5		
November 21-23	-3	- 4	-2		
December 5-7	1	0	2		

.

# Deviation from Golfer's Performance Score Average for J. A. Washam

Dates of		Deviation	from Average	(73)	
Tourneys	1	2	3	2 <u>-</u>	4
January 31-					
February 2	4	0	- 4		
February 7-9	2	-1	0		
February 21-23	1	-2	8		
March 27-29	-1	-1	- 4		
April 17-20	3	-3	0		-1
April 25-27	2	-1	0		
May 2-4	- 5	1	2		
May 23-25	-1	-2	- 3		
May 29-June 1	-2	3	-1		-2
June 13-15	-1	-3	7		
June 27-29	4	0	6		
July 11-13	0	2	. 3		8
July 25-27	-3	-1	-1		
August 15-17	-4	- 4	-5		
August 22-24	-3	-3	2		
September 5-7	0	1	0		
September 19-21	-2	2	- 4		2
November 14-16	9	0	4		
November 21-23	-2	2	6		
December 5-7	-2	3	3		
December 13-14	-1	-2			
and the second					

APPENDIX B-13

Deviation from Solfer's Performance Score Average for C. J. Skala

Dates of			from Average	
Tourneys	1	2	3	4
January 31- February 2	-3	-3	-3	
February 7-9	2	-3	-3	
March 21-23	2	-1	5	
April 17-20	0	-4	1	-6
May 23-25	-3	-4	-6	***
May 29-June 1	-1	4	-4	(
June 6-8	2	0	2	
June 27-29	0	- 2	-1	
July 4-6	-2	1	-2	
July 11-13	- 4	-3	-4	
July 25-27	0	0	-3	
September 5-7	0	0	4	
September 12-14	2	2	5	
September 19-21	3	2	3	
October 17-19	0	4	2	
October 23-24	3	4		

# Deviation from Golfer's Performance Score Average for P. Bradley

	1.1				
Dates of Tourney	1	Deviation 2	from Average 3		4
January 31-					
February 2	2	-2	1		
February 21-23	0	-3	-2		
March 21-23	5	-3	2		_
March 27-29	2	-3	-1		
April 25-27	-2	-2	-1		
May 2-4	-3	-1	-1		
May 9-11	0	3	4		
May 23-25	-4	0	0		
May 29-June 1	2	-1	0		6
June 6-8	4	-1	3		
June 13-15	3	2	0		
June 20-22	1	1	0		
June 27-29	5	-1	-2		
July 11-13	0	0	- 4		
July 25-27	1	5	4		
August 15-17	0	-1	-4		
August 22-24	-2	1	3		
September 5-7	-3	0	6		
September 19-21	-1	0	3		
October 17-19	5	0	1		
October 23-26	1	- 4	3		0
November 14-16	6	1	0		
November 21-23	-5	-4	0		
December 5-7	0	-2	-1	-	
December 13-14	3	5			

# APPENDIX B-15

Deviation from Golfer's Performance Score Average for A. Alcott

Dates of Tourneys	1		from Average 3	(74)
January 31- February 2	-1	-2	2	
February 7-9	1	-2	-2	
February 21-23	-6	-6	-3	
April 17-20	2	-1	-3	- 3
April 25-27	-5	-1	- 4	
May 2-4	-1	-3	0	
May 9-11	0	-4	5	
June 6-8	0	-1	2	
June 13-15	-2	-1	8	<ul> <li>Sec.</li> </ul>
June 20-22	-1	-5	-1	
June 27-29	0	-3	1	
July 11-13	-1	-3	- 4	
July 25-27	1	0	-3	
August 22-24	-3	-5	-3	
September 5-7	- 3	-3	3	
September 12-14	6	-1	-2	
September 19-21	-2	2	1	2
October 17-19	3	1	3	
November 14-16	3	4	-2	
December 5-7	4	0	1	

,

# Deviation from Golfer's Performance Score Average for B. Cullen

Dates of Tourneys	1	Deviation 2	from Average	(74)
January 18-19	0	3		
January 31- February 2	0	3	2	
February 7-9	1	-2	1	14.2
March 27-29	0	-6	-1	
April 17-20	-1	- 4	0	-2
May 9-11	- 4	4	-2	
May 23-25	-4	1	-4	
May 29-June 1	-2	4	-1	3
June 13-15	1	2	1	
June 20-22	-3	- 4	- 4	
June 27-29	4	-1	2	
July 4-6	-3	2	-1	
July 11-13	1	-2	-1	
August 15-17	- 5	2	0	
August 22-24	-1	-2	-5	
September 5-7	- 5	2	-1	
September 12-14	0	- 4	5	
September 19-21	3	-1	3	
October 17-19	3	3	7	
October 23-26	- 2	- 2	3	- 2
November 14-16	7	0	4	
November 21-23	0	4	0	
December 5-7	1	2	3	

Deviation from Golfer's Performance Score Average for J. Buerassa

Dates of			from Average	(75)
Tourneys	1	2	3	
January 31-				
February 2	-1	3	-1	
February 7-9	-5	-2	0	
February 21-23	-2	-1	3	
March 21-23	0	7	3	
April 17-20	-4	-5	- 2	(
April 25-27	2	1	0	
May 2-4	-3	3	-3	
May 9-11	- 4	0	3	
May 23-25	-3	-5	-6	
May 29-June 1	-1	-1	- 3	-2
June 6-8	-3	0	1	
June 13-15	0	0	0	
June 27-29	-4	-1	-3	
July 11-13	-3	-5	- 4	
July 25-27	2	-5	-3	
August 15-17	-2	-7	-6	
August 22-24	-2	1	- 2	
September 5-7	3	0	2	
September 12-14	1	2	3	
September 19-21	-2	6	1	
October 17-19	0	8	5	
October 23-26	-5	-1	- 4	2
November 14-16	1	1	2	

.

## Deviation from Golfer's Performance Score Average for S. Roberts

Dates of Tourneys	1	Deviation 2	from Average 3	(74)
January 31- February 2	2	-2	0	
February 7-9	-2	3	2	18 A. P.
February 21-23	-2	1	-1	
June 1	3			
June 6-8	-2	-1	3	
June 13-15	2	4	6	
June 20-22	0	- 4	-3	
June 27-29	-1	- 2	-2	
July 11-13	2	-3	0	
July 25-27	-1	2	0	
August 15-17	-2	-4	1	
August 22-24	5	2	0	
September 5-7	- 4	5	-1	
September 12-14	6	0	4	
November 14-16	8	-2	6	
November 21-22	6	1		1

Deviation from Golfer's Performance Score

Dates of		Doviation	from Average	(7/)	
Tourneys	1	2	3	(74)	4
February 21-23	0	-4	1		
March 21-23	3	2	2		
March 27-29	-2	-2	-2		-
April 17-20	-2	-4	-1		4
April 25-27	-5	2	-2		
May 2-4	-1	1	-2		-
May 9-11	2	2	5		
May 23-25	-2	1	-2		
May 29-June 1	6	2	5		1
June 6-8	2	-2	4		
June 20-22	-6	-2	-2		
July 4-6	-4	-1	1		
July 11-13	0	-6	-2		
July 25-27	-1	4	3		
August 15-17	1	-1	-3		-
August 22-24	- 2	-1	5		
September 5-7	0	1	7		
September 12-14	1	-1	6		
November 14-16	8	3	2		
November 21-23	. 1	-1	-1	11 - 11 - 11 - 11 - 11 - 11 - 11 - 11	
December 5-7	5	-1	4		

Average for D. Austin

## Deviation from Golfer's Performance Score Average for J. Kazmierski

APPENDIX B-20

January 31- February 2 $-4$ $-2$ $-1$ February 2 $-4$ $-2$ $-1$ February 7-912 $-4$ March 21-23024March 27-29 $-3$ $-3$ $-1$ April 17-200 $-4$ $-1$ $-1$ April 25-27 $-9$ 34May 2-4 $-4$ $-1$ $-3$ May 9-113 $-2$ $-1$ May 23-25 $-1$ $-2$ $-3$	Dates of	1.00		from Average	
February 2       -4       -2       -1         February 7-9       1       2       -4         March 21-23       0       2       4         March 27-29       -3       -3       -1         April 17-20       0       -4       -1       -1         April 25-27       -9       3       4       -1         May 2-4       -4       -1       -3       -3         May 9-11       3       -2       -1       -1         May 23-25       -1       -2       -3       -3         May 29-June 1       0       1       0       1         June 6-8       -1       2       6       -2         June 13-15       0       -1       4       -4         June 20-22       0       0       0       0         July 4-6       -2       2       4       -2       -2         July 11-13       3       -3       0       -4       -1         September 5-7       -5       7       -3       -3       -2         November 12-14       -5       4       6       -4       -2       -2       -4       -4	Tourneys	1	2	3	4
March 21-23       0       2       4         March 27-29       -3       -3       -1         April 17-20       0       -4       -1       -1         April 25-27       -9       3       4         May 2-4       -4       -1       -3         May 9-11       3       -2       -1         May 2-4       -4       -1       -3         May 9-11       3       -2       -1         May 23-25       -1       -2       -3         May 29-June 1       0       1       0       1         June 6-8       -1       2       6		-4	-2	-1	
March 27-29       -3       -3       -1         April 17-20       0       -4       -1       -1         April 25-27       -9       3       4         May 2-4       -4       -1       -3         May 9-11       3       -2       -1         May 23-25       -1       -2       -3         May 29-June 1       0       1       0       1         June 6-8       -1       2       6       1         June 13-15       0       -1       4       1         June 20-22       0       0       0       1         July 4-6       -2       2       4       1         July 11-13       3       -3       0       1         August 22-24       -2       -1       -1       1         September 5-7       -5       7       -3       5         September 12-14       -5       4       6       6         September 19-21       2       1       2       1       2         November 14-16       5       2       2       1       2       1       2         November 5-7       -2       -4       1	February 7-9	1	2	- 4	
April 17-20       0       -4       -1       -1         April 25-27       -9       3       4         May 2-4       -4       -1       -3         May 9-11       3       -2       -1         May 23-25       -1       -2       -3         May 29-June 1       0       1       0       1         June 6-8       -1       2       6       1         June 13-15       0       -1       4       1         June 20-22       0       0       0       1         July 4-6       -2       2       4       1         July 11-13       3       -3       0       1         August 22-24       -2       -1       -1       1         September 5-7       -5       7       -3       3         September 12-14       -5       4       6       2       2         November 14-16       5       2       2       2       1       2         November 14-16       5       2       2       2       1       2       1       2       1       2       1       1       1       1       1       1       1 <td>March 21-23</td> <td>0</td> <td>2</td> <td>4</td> <td></td>	March 21-23	0	2	4	
April 25-27       -9       3       4         May 2-4       -4       -1       -3         May 9-11       3       -2       -1         May 23-25       -1       -2       -3         May 29-June 1       0       1       0       1         June 6-8       -1       2       6       -1         June 13-15       0       -1       4       -1         June 20-22       0       0       0       0         June 27-29       1       1       2       -1         July 4-6       -2       2       4       -1         July 11-13       3       -3       0       -3         August 22-24       -2       -1       -1       -1         September 5-7       -5       7       -3       -3         September 12-14       -5       4       6       -2       2         November 14-16       5       2       2       -2       -2         November 21-23       -1       -1       -5       -5       -1       -1         December 5-7       -2       -4       1       -5       -4       1       -5	March 27-29	-3	-3	-1	
May 2-4       -4       -1       -3         May 9-11       3       -2       -1         May 23-25       -1       -2       -3         May 29-June 1       0       1       0       1         June 6-8       -1       2       6       1         June 13-15       0       -1       4       1         June 20-22       0       0       0       1         June 27-29       1       1       2       1         July 4-6       -2       2       4       1         July 11-13       3       -3       0       1         August 22-24       -2       -1       -1       1         September 5-7       -5       7       -3       3         September 12-14       -5       4       6       6         September 19-21       2       1       2       1       2         November 14-16       5       2       2       1       2       1         December 5-7       -2       -4       1       1       1       1       1	April 17-20	0	-4	-1	-1
May 9-11       3       -2       -1         May 23-25       -1       -2       -3         May 29-June 1       0       1       0       1         June 6-8       -1       2       6         June 13-15       0       -1       4         June 20-22       0       0       0         June 27-29       1       1       2         July 4-6       -2       2       4         July 11-13       3       -3       0         August 22-24       -2       -1       -1         September 5-7       -5       7       -3         September 12-14       -5       4       6         September 19-21       2       1       2         November 14-16       5       2       2         November 21-23       -1       -1       -5         December 5-7       -2       -4       1	April 25-27	-9	3	4	
May 23-25       -1       -2       -3         May 29-June 1       0       1       0       1         June 6-8       -1       2       6         June 13-15       0       -1       4         June 20-22       0       0       0         June 27-29       1       1       2         July 4-6       -2       2       4         July 11-13       3       -3       0         August 22-24       -2       -1       -1         September 5-7       -5       7       -3         September 12-14       -5       4       6         September 19-21       2       1       2         November 14-16       5       2       2         November 21-23       -1       -1       -5         December 5-7       -2       -4       1	May 2-4	-4	-1	-3	
May 29-June 1       0       1       0       1         June 6-8       -1       2       6         June 13-15       0       -1       4         June 20-22       0       0       0         June 27-29       1       1       2         July 4-6       -2       2       4         July 11-13       3       -3       0         August 22-24       -2       -1       -1         September 5-7       -5       7       -3         September 12-14       -5       4       6         September 19-21       2       1       2         November 14-16       5       2       2         November 21-23       -1       -1       -5         December 5-7       -2       -4       1	May 9-11	3	-2	-1	
June 6-8-126June 13-150-14June 20-22000June 27-29112July 4-6-224July 11-133-30August 22-24-2-1-1September 5-7-57-3September 12-14-546September 19-21212November 14-16522November 21-23-1-1-5December 5-7-2-41	May 23-25	-1	-2	-3	
June 13-150-14June 20-22000June 27-29112July 4-6-224July 11-133-30August 22-24-2-1-1September 5-7-57-3September 12-14-546September 19-21212November 14-16522November 21-23-1-1-5December 5-7-2-41	May 29-June 1	0	1	. 0	1
June 20-22000June 27-29112July 4-6-224July 11-133-30August 22-24-2-1-1September 5-7-57-3September 12-14-546September 19-21212November 14-16522November 21-23-1-1-5December 5-7-2-41	June 6-8	-1	2	6	
June 27-29112July 4-6-224July 11-133-30August 22-24-2-1-1September 5-7-57-3September 12-14-546September 19-21212November 14-16522November 21-23-1-1-5December 5-7-2-41	June 13-15	0	-1	4	
July 4-6-224July 11-133-30August 22-24-2-1-1September 5-7-57-3September 12-14-546September 19-21212November 14-16522November 21-23-1-1-5December 5-7-2-41	June 20-22	0	0	0	
July 11-13       3       -3       0         August 22-24       -2       -1       -1         September 5-7       -5       7       -3         September 12-14       -5       4       6         September 19-21       2       1       2         November 14-16       5       2       2         November 21-23       -1       -1       -5         December 5-7       -2       -4       1	June 27-29	1	1	2	
August 22-24       -2       -1       -1         September 5-7       -5       7       -3         September 12-14       -5       4       6         September 19-21       2       1       2         November 14-16       5       2       2         November 21-23       -1       -1       -5         December 5-7       -2       -4       1	July 4-6	-2	2	4	
September 5-7       -5       7       -3         September 12-14       -5       4       6         September 19-21       2       1       2         November 14-16       5       2       2         November 21-23       -1       -1       -5         December 5-7       -2       -4       1	July 11-13	3	-3	0	
September 12-14       -5       4       6         September 19-21       2       1       2         November 14-16       5       2       2         November 21-23       -1       -1       -5         December 5-7       -2       -4       1	August 22-24	-2	-1	-1	
September 19-21       2       1       2         November 14-16       5       2       2         November 21-23       -1       -1       -5         December 5-7       -2       -4       1	September 5-7	-5	7	-3	
November 14-16         5         2         2           November 21-23         -1         -1         -5           December 5-7         -2         -4         1	September 12-14	-5	4	6	
November 21-23         -1         -1         -5           December 5-7         -2         -4         1	September 19-21	2	1	2	
December 5-7 -2 -4 1	November 14-16	5	2	2	
	November 21-23	-1	-1	-5	
December 13-14 2 2	December 5-7	-2	-4	1	
	December 13-14	2	2		

APPENDIX C

PRINT-OUTS FOR THE ORIGINAL BIORHYTHM CYCLES OF THE TOP TWENTY GOLFERS FOR THE

YEAR 1975

KEY

1. Average/Above Average Efficiency = Positive

Values on Print-outs.

2. Below Average Efficiency = Negative Values on

Print-outs.

3. Critical Efficiency =  $\pm 0.000$ ,  $\pm .136$ ,  $\pm .095$  on

Print-outs.

		SANDRA	PALMER					
103		3-1	-1941					
DAY I MAY	II III	I JUNE	I I I	11 11AN	111	I A	UGUST II	111
4 0.888 10 0 5 0.979 11 0 6 0.998 12 0 7 0.942 13 0 8 0.817 14 -0 9 0.631 15 -0	92 29 -0.69 23 30 -0.54 34 31 -0.37 23 32 -0.18 23 32 -0.18 23 1 0.18	-0.136 13 0.223 2 -0.398 14 -0.000 2 -0.631 15 -0.223 2 -0.817 16 -0.434 3 -0.942 17 -0.623 3 -0.998 18 -0.782 3	910 19 -0.85 815 20 -0.73 650 21 -0.52 541 22 -0.27 372 0 0.00 189 1 0.27	15 -0.223 16 -0.434 17 -0.434 17 -0.623 19 -0.782 19 -0.901 20 -0.975	990 9990 972 972 972 15 815	0,885 0,979 0,979 0,942 0,942 0,942 0,942 0,942 0,942	-0.782 2 -0.901 2 -0.975 2 -0.975 2	
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	234 2 0.372 234 2 0.372 234 3 0.541 82 4 0.690 01 5 0.815 75 6 0.910 70 7 0.972	0.978 18 -0.982 9 -0.888 20 -0.975 0 -0.731 21 -0.975 1 -0.520 22 -0.975 2 -0.270 23 -0.901 2 -0.270 23 -0.901	+0.189 1 0.27 0.189 2 0.52 0.189 3 0.73 0.372 4 0.88 0.541 5 0.97 0.541 5 0.99 0.690 6 0.99	0 20 -0.975 29 0 21 -1.000 30 1 22 -0.975 31 1 23 -0.975 31 2 24 -0.975 32 9 24 -0.782 0 8 25 -0.623 1 9 25 -0.623 1	-0.690  9 -0.541  10 -0.372  11 -0.189  12 0.000  13 0.189  14	0.631 2 0.398 2 -0.136 2 -0.398 2	0.782 0.782 0.623 0.434 0.223 0.223 0.000 3	8 -0,910 8 -0,910 9 -0,690 1 -0,541 1 -0,5
16 -0.942 22 -0 17 -0.995 23 -0 18 -0.979 24 -0 19 -0.888 25 -0	75 8 0.999 01 9 0.999 82 10 0.945 82 11 0.866	0.270 25 -0.623 0.520 26 -0.434 0.731 27 -0.223 0.888 0 0.000	9101 11 0.13 9721 9 0.63 9721 9 0.63 9991 10 0.39	26 -0.434 27 -0.223 1 0.223 2 0.434	.372  1 .541  1 .690  1 .815  1	-0.942 -0.942 -0.979	0.434	0.37
7   20 -0.731 26 -0. 8   21 -0.520 27 -0. 9   22 -0.270 0 0.	34 12 0.756 23 13 0.618 00 14 0.458	0.979 1 0.223 1 0.958 2 0.434 1 0.942 3 0.623 1	945 12 -0.13 866 13 -0.39 756 14 -0.63	3 0.623 4 0.782 5 0.901	99991 2	-0.731	0.975	0.91
0     1     0     0.000     1     0.       1     1     1     0.270     2     0.       2     1     2     0.520     3     0.	23 15 0.282 34 16 0.095 23 17 -0.095	6         0.817         4         0.782         1           9         0.631         5         0.901         1           0         0.398         6         0.975         1	618 15 -0.81 458 16 -0.94 282 17 -0.99	6 0.975 1 7 1.000 1 8 0.975 1	9451 8661 7561	0.270 1	0.901	66° 0
3   3 0.731 4 0. 4   4 0.888 5 0. 5   5 0.979 6 0.	B2     18     -0.282       C1     19     -0.458       75     20     -0.618	1 0.136 7 1.000 16 2 -0.136 8 0.975 17 3 -0.398 9 0.901 18	$\begin{array}{c} 0.0951 18 - 0.97 \\ 0.0951 19 - 0.88 \\ 0.2421 20 - 0.73 \end{array}$	9 0.901 1 10 0.782 1	6181 4581	0.731 1	0.434 1	0.86
6   6 0.998 7 1. 7   7 0.942 8 0. 8   8 0.817 9 0	1 23 -0 945	4 -0.631 10 0.782 19 5 -0.817 11 0.623 20 6 -0.842 12 0.623 21	0.458 21 -0.52	12 0.434 16 13 0.223 17	0.095	0.998 1	-0.223 1	0.45
9   9 0.631 10 0. 1   11 0.136 12 C.	12 24 -0.990 23 25 -0.999 34 26 -0.972	-0.999 13 0.223 22 -0.979 14 -0.000 23 -0.888 15 -0.223 24	.866 1 0.27 .945 2 0.52 .990 3 0.73	15 -0.223 19 16 -0.434 20 17 -0.623 21	4581 6181 1 7561 1	0.398 1	-0.901 1 -0.975 1	-0.28
I STANDS FOR THE PHYSICA II STANDS FUR THE EMOTIO III STANDS FUR THE INTEL	L CYCLE (23 DA NAL CYCLE (23 LECTUAL CYCLE	YS) DAYS) (33 DAYS)						
							•	
02		SANDRA	PALMER					
DAY 10	AKY	FEBRU	41			А		
		11	III I	11 7	111			111
1 22 -0.270 2 0.4 2 0 0.000 3 0.4 3 1 0.270 4 0.7 4 2 0.520 5 0.9 5 3 0.731 6 0.9 6 4 0.888 7 1.0 7 5 0.979 8 0.9	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	7 0.942 5 0.901 8 0.817 6 0.975 9 0.631 7 1.000 0 0.398 8 0.975 1 0.136 9 0.901 2 -0.136 10 0.782 2 -0.136 10 0.782 3 -0.398 11 0.623	0.910 12 -0.13 0.972 13 -0.39 0.999 14 -0.63 0.999 15 -0.81 0.945 16 -0.94 0.866 17 -0.99 0.756 18 -0.97	9001100	0.1891 20 0.3721 21 0.5411 22 0.5411 22 0.6901 0 0.8151 1 0.9101 2 0.9721 3	-0.731 -0.520 -0.270 1 0.270 1 0.270 1 0.520 1 0.520 1 0.520 1	8 0.975 3 9 0.901 3 0 0.782 1 0.434 2 0.434 3 0.223 4 -0.000	2 -0.189 0 0.000 1 0.189 2 0.372 2 0.372 3 0.541 4 0.690 5 0.815
B       6       0.998       9       0         9       7       0.942       10       0         0       8       0.817       11       0         1       9       0.631       12       0         2       10       0.398       13       0	1     1     0     1       82     15     0     095       23     17     -0     095       34     18     -0     282       23     19     -0     458	-0.631 12 0.434 1 -0.817 13 0.223 1 -0.942 14 -0.000 1 -0.958 15 -0.223 1 -0.979 16 -0.434 1	0.458 20 -0.7 0.282 21 -0.5 0.095 22 -0.2 0.095 0.00	1       13       0.434         1       13       0.223         0       14       -0.000       1         0       14       -0.223       1         0       15       -0.223       1         0       16       -0.434       1	.9991 .9901 .9451 .8661 .7561	0.888 0.979 0.998 0.942 0.942 0.817	5 - 10, 223 5 - 10, 223 5 - 10, 223 7 - 10, 223 7 - 10, 223 8 - 10, 223 8 - 10, 223 8 - 10, 223 8 - 10, 223 7 - 10, 223 8 - 10, 223 7 - 10, 205 7 - 10	0.99
111 0.136 14 -0. 12 -0.136 15 -0. 13 -0.398 15 -0. 14 -0.631 17 -0. 15 -0.617 18 -0.	00 20 -0.618 23 21 -0.756 34 22 -0.866 23 23 -0.945 82 24 -0.990	9       -0.888       17       -0.623       1         0       -0.731       18       -0.782       1         1       -0.520       19       -0.901       2         2       -0.270       20       -0.975       2         0       0.000       21       -1.000       2	.282     1     0.2       .458     2     0.5       .618     3     0.7       .756     4     0.6       .866     5     0.9	0 17 -0.623 1 0 18 -0.782 1 1 19 -0.901 1 8 20 -0.975 1 9 21 -1.000 1	0.618 0.458 0.282 0.095 1 0.095 1	0.631 2 0.398 2 0.136 2 -0.136 2 -0.398 2	0 -0.975 1 1 -1.000 1 2 -0.975 1 3 -0.975 1 3 -0.901 1 4 -0.782 1	0.86
8       16       -0.942       19       -0.         9       17       -0.998       20       -0.         0       18       -0.979       21       -1.         1       19       -0.888       22       -0.	75 25 -0.999 75 25 -0.972 75 28 -0.910 75 28 -0.815	0.520 23 -0.975 2 0.520 23 -0.901 2 0.731 24 -0.782 2 0.888 25 -0.623 2	0.9991 7 0.9 0.9991 7 0.9 0.9991 8 0.8 0.9721 9 0.6	8 22 -0.975 1 2 23 -0.901 1 7 24 -0.782 2 1 25 -0.623 2	.2821 1 .4581 1 .6181 1 .7561 1	-0.817 2 -0.942 2 -0.958	5 -0.623 1 6 -0.434 1 7 -0.223 1 0 0.000 1	-0.26
2   20 -0.731 23 -0. 3   21 -0.520 24 -0. 4   22 -0.270 25 -0. 5   0 0.000 26 -0.	01 29 -0.690 82 30 -0.541 23 31 -0.372 34 32 -0.189	$\begin{array}{c} 0.979 \ 26 \ -0.434 \ 2 \\ 0.998 \ 27 \ -0.223 \ 2 \\ 0.942 \ 0 \ 0.900 \ 2 \\ 0.817 \ 1 \ 0.223 \ 3 \end{array}$	0.4151 10 0.3 0.6901 12 -0.1 0.5411 13 -0.3	8 26 -0.434 2 6 27 -0.223 2 6 0 0.000 2 8 1 0.223 2	0.9451 0.9901 0.9991 20.9991	-0.979 -0.731	0.223 2	-0.51
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	23 0 0.000 00 1 0.189 23 2 0.372	0.631 2 0.434 3 0.398 3 0.623 3 0.136 4 0.782	0.372114 -0.6 0.189115 -0.8 0.000116 -0.9	1 2 0.434 2 7 3 0.623 2 2 4 0.782 2 8 5 0.901 2	0.9721 2	-0.270	0.901 2	-0.99
0   5 0.979 3 0. 1   6 0.978 4 0.	23 4 0.690 82 5 0.815	3 -0.398 6 0.975 4 -0.631 7 1.000	.372 18 -0.9 .541 19 -0.8	9 6 0.975 3 8 7 1.000 3	0.5411 0.3721	0.731	0.901 2	-0.81
I STANDS FOR THE PHYSIC II STANDS FOR THE EMOTIO III STANDS FOR THE INTER	AL CYCLE (23 D UNAL CYCLE (28 LLECTUAL CYCLE	NS) PAVS) (33 DAVS)						

	5	JOANNE CARNER
4 3 2 1	UNY	I JANUARY FEBRUARY III IAPRIL III I APRIL III III I APRIL III III III III III III III III III
110 9 8 7 6 5 4	0 U 4 U NH	-0.817 8 0.975 21 -0.756 0 0.000 11 0.623 19 -0.458 5 0.979 11 0.623 14 0.458 13 -0.398 14 -0.000 12 0.756 -0.998 10 0.782 23 -0.945 2 0.520 12 0.434 20 -0.618 6 0.998 12 0.434 15 0.282 14 -0.631 15 -0.223 13 0.618 -0.979 11 0.623 24 -0.9990 3 0.731 14 -0.000 22 2.0.866 8 0.817 14 -0.000 17 -0.095 15 -0.817 16 -0.434 14 0.458 -0.979 11 0.623 24 -0.9990 4 0.683 15 -0.223 23 -0.945 9 0.631 15 -0.223 16 0.095 15 -0.942 17 -0.623 15 0.282 -0.731 13 0.223 26 -0.972 5 0.979 16 -0.434 24 -0.490 17 0.945 19 -0.223 18 -0.282 11 -0.998 18 -0.782 16 0.095
12 13 14 15 16	10 12 13	1       -0.520       14       -0.000       27       -0.910       6       0.998       17       -0.623       25       -0.999       11       0.136       17       -0.633       20       -0.618         2       -0.270       15       -0.223       28       -0.815       7       0.942       18       -0.782       26       -0.972       12       -0.136       18       -0.782       21       -0.756         0       0.000       16       -0.434       29       -0.6901       8       0.817       19       -0.901       27       -0.398       19       -0.901       27       -0.398       19       -0.901       27       -0.398       19       -0.901       27       -0.631       14       -0.631       20       -0.945       23       -0.945       23       -0.945       23       -0.945       23       -0.945       23       -0.945       23       -0.945       23       -0.945       23       -0.945       23       -0.945       23       -0.945       23       -0.945       23       -0.945       23       -0.945       23       -0.945       23       -0.945       23       -0.945       23       -0.945       24       -0.996
18 19 20 21 22 23 23	18 15 13	4       0.488       20       -0.975       0       0.000       12       -0.136       23       -0.901       31       -0.372       17       -0.998       23       -0.972       2       0.520       26       -0.424       24       -0.978       23       -0.998       23       -0.901       26       -0.424       24       -0.978       23       -0.971       20       -0.972       2       0.520       26       -0.424       24       -0.978       23       -0.998       23       -0.901       26       -0.424       24       -0.978       27       -0.972       2       0.520       26       -0.424       24       -0.978       23       -0.971       24       -0.972       2       0.520       26       -0.424       24       -0.978       27       -0.972       2       0.731       26       -0.424       24       -0.978       27       -0.972       2       -0.972       2       -0.972       2       -0.972       2       -0.972       2       -0.972       2       -0.972       2       -0.972       2       -0.972       2       -0.972       2       -0.972       2       -0.972       2       -0.972       2       -0.972       2<
25 26 27	22	0.398       20       -0.434       6       0.9101       18       -0.979       1       0.223       4       0.6000       1       0.223       32       -0.1691       8       0.817       4       0.782       30       -0.54         -0.136       27       -0.223       7       0.9721       19       -0.868       2       0.434       5       0.8151       1       0.223       32       -0.1691       8       0.817       4       0.782       30       -0.54         -0.136       0       0.000       8       0.9991       20       -0.731       3       0.623       6       0.9101       2       0.520       3       0.623       1       0.1891       10       0.398       6       0.975       32       -0.18         -0.398       1       0.223       9       0.434       0       0.623       1       0.1891       10       0.398       6       0.975       32       -0.18         -0.398       1       0.223       9       0.434       0       0.782       2       0.3721       10       0.388       6       0.975       32       -0.18         -0.398       1       0.223       9
29	224	4 -0.631 2 0.434 10 0.9451 22 -0.270 5 0.901 8 0.9991 4 0.888 5 0.901 3 0.5411 12 -0.136 8 0.9075 1 0.00 5 -0.817 3 0.623 11 0.8661 0 0.000 6 0.975 9 0.9901 5 0.979 6 0.975 4 0.6901 13 -0.398 9 0.901 2 0.37 6 -0.942 4 0.782 12 0.7561 1 0.270 7 1.000 10 0.9451 6 0.998 7 1.000 5 0.8151 14 -0.631 10 0.782 2 0.37
31 32 33	8 1 0	17 -0.998 5 0.901 13 0.618 2 0.520 8 0.975 11 0.866 7 0.972 6 0.915 11 4 -0.631 10 0.782 3 0.54 18 -0.979 6 0.975 14 0.4581 3 0.731 9 0.901 12 0.756 8 0.817 9 0.901 7 0.972 16 -0.942 12 0.434 5 0.81 19 -0.888 7 1.000 15 0.2821 4 0.868 10 0.762 13 0.618 9 0.431 9 0.901 7 0.972 16 -0.942 12 0.434 5 0.81
36 34	29 30 31	20 -0.731 8 0.975 16 0.0951 5 0.979 11 0.623 14 0.458 10 0.398 11 0.623 9 0.9991 17 -0.998 13 0.223 6 0.91 21 -0.520 9 0.901 17 -0.0951 6 0.998 12 0.434 15 0.2821 11 0.136 12 0.434 10 0.9451 19 -0.888 15 -0.223 8 0.99 22 -0.270 10 0.782 18 -0.2821 7 0.942 13 0.223 16 0.0951 12 -0.136 13 0.223 11 0.8661 20 -0.731 16 -0.434 9 0.99
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ω <u>4</u> 0 0 μ α		9 -0.888 0 0.000 27 -0.9101 3 0.731 2 0.434 24 -0.9901 11 0.136 5 0.901 22 -0.8661 18 -0.979 7 1.000 19 -0.458 0 -0.731 1 0.223 28 -0.8151 4 0.888 3 0.623 25 -0.9951 12 -0.136 6 0.975 23 -0.9451 19 -0.888 8 0.975 20 -0.518 1 -0.520 2 0.434 29 -0.6901 5 0.979 4 0.782 26 -0.9721 13 -0.398 7 1.000 24 -0.9901 20 -0.731 9 0.901 21 -0.756 2 -0.276 3 0.623 30 -0.5411 6 0.998 5 0.901 27 -0.9101 14 -0.631 8 0.975 25 -0.9991 21 -0.520 10 0.782 22 -0.866 2 -0.276 3 0.623 31 -0.3721 7 0.942 6 0.975 28 -0.8151 15 -0.817 9 0.901 26 -0.9721 22 -0.270 11 0.623 73 -0.9451 0 0.000 4 0.782 31 -0.3721 7 0.942 6 0.975 28 -0.8151 15 -0.817 9 0.901 26 -0.9721 22 -0.270 11 0.623 73 -0.9451 1 0.270 5 0.901 32 -0.1891 8 0.817 7 1.000 29 -0.6901 16 -0.942 10 0.782 27 -0.9101 0 0.000 12 0.434 24 -0.9901
NHOU	14 15 16	0.520 6 0.975 0 0.000 9 0.631 8 0.975 30 -0.541 17 -0.998 11 0.623 28 -0.815 1 0.275 13 0.223 25 -0.999 0.731 7 1.000 1 0.189 10 0.398 9 0.901 31 -0.372 18 -0.979 12 0.434 29 -0.6501 2 0.520 14 -0.000 26 -0.972 0.888 8 0.975 2 0.372 11 0.136 10 0.782 32 -0.189 19 -0.888 13 0.223 30 -0.541 3 0.731 15 -0.223 27 -0.910 0.9097 9 0.975 9 0.901 3 0.541 12 -0.136 11 0.623 0 0.000 20 -0.731 14 -0.000 31 -0.372 4 0.888 16 -0.434 28 -0.815 1 0.975 10 0.975 10 0.975 10 0.975 10 0.975 10 0.200 31 -0.372 4 0.888 16 -0.434 28 -0.815 10 0.975 10 0.955 10 0.975 10 0.975 10 0.975 10 0.975
	18 19 20 21	0.998 10 0.782 4 0.6901 13 -0.398 12 0.434 1 0.1891 21 -0.520 15 -0.223 32 -0.1891 5 0.979 17 -0.623 29 -0.6901 0.942 11 0.623 5 0.8151 14 -0.631 13 0.223 2 0.3721 22 -0.270 16 -0.434 0 0.0001 6 0.998 18 -0.782 30 -0.5411 0.817 12 0.434 6 0.9101 15 -0.817 14 -0.000 3 0.5411 0 0.000 17 -0.623 1 0.1891 7 0.942 19 -0.901 31 -0.3721 0.631 13 0.223 7 0.9721 16 -0.942 15 -0.223 4 0.6901 1 0.270 18 -0.782 2 0.3721 8 0.817 20 -0.975 32 -0.1891
		0 0.398 14 -0.000 8 0.9991 17 -0.998 16 -0.434 5 0.8151 2 0.520 19 -0.901 3 0.5411 9 0.631 21 -1.000 0 0.0001 1 0.136 15 -0.223 9 0.9901 18 -0.979 17 -0.623 6 0.9101 3 0.731 20 -0.975 4 0.6901 10 0.398 22 -0.975 1 0.1891 2 -0.136 16 -0.434 10 0.9451 19 -0.883 18 -0.782 7 0.9721 4 0.888 21 -1.000 5 0.8151 11 0.136 23 -0.901 2 0.3721 3 -0.398 17 -0.623 11 0.8661 20 -0.731 19 -0.901 8 0.9991 5 0.979 22 -0.975 6 0.9101 12 -0.136 24 -0.782 3 0.5411
ω N - C	0 7 6	-0.631 18 -0.782 12 0.756 21 -0.520 20 -0.975 9 0.990 6 0.998 23 -0.901 7 0.9721 13 -0.398 25 -0.623 4 0.690 -0.817 19 -0.901 13 0.6181 22 -0.270 21 -1.000 10 0.9451 7 0.942 24 -0.782 8 0.9991 14 -0.631 26 -0.434 5 0.815 -0.910 -0.942 20 -0.975 14 0.4561 0 0.000 22 -0.975 11 0.8661 8 0.617 25 -0.623 9 0.9901 15 -0.817 27 -0.223 6 0.910 -0.910 -0.942 20 -0.942 20 -0.975 14 0.4561 0 0.000 22 -0.975 11 0.8661 8 0.617 25 -0.623 9 0.9901 15 -0.817 27 -0.223 6 0.910 -0.910 -0.942 20 -0.942 20 -0.975 14 0.4561 0 0.000 22 -0.975 11 0.8661 8 0.617 25 -0.623 9 0.9901 15 -0.817 27 -0.223 6 0.910 -0.91
4 0 0 4		7 -0.978 21 -1.000 13 0.2821 1 0.270 23 -0.901 12 0.7301 9 0.031 20 -0.434 10 0.4431 10 -0.9742 0 0.000 7 0.7721 8 -0.979 22 -0.975 16 0.0951 2 0.520 24 -0.782 13 0.6181 10 0.398 27 -0.223 11 0.8661 17 -0.998 1 0.223 8 0.9991 9 -0.888 23 -0.901 17 -0.0951 3 0.731 25 -0.623 14 0.4581 11 0.136 0 0.000 12 0.7561 18 -0.979 2 0.434 9 0.9901
2 0 0 0	I STAND: II STANI III STAN	DS FOR THE PHYSICAL CYCLE (23 DAYS) NDS FOR THE EMDTIONAL CYCLE (28 DAYS) ANDS FOR THE INTELLECTUAL CYCLE (33 DAYS)
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DAT SEPTEMBE II III I OCTURER II NOVEMBER II DECEMBER III
5       0.979       27       -0.223       0       0.000       12       -0.136       1       0.223       30       -0.541       20       -0.731       4       0.782       28       -0.815       4       0.888       6       0.975       25       -0         6       0.998       0       0.000       1       0.136       1       0.223       30       -0.541       20       -0.731       4       0.782       28       -0.815       4       0.888       6       0.975       25       -0         6       0.998       0       0.000       1       0.1891       13       -0.323       31       -0.3721       21       -0.520       5       0.901       29       -0.6901       5       0.979       7       1.000       26       -0.975       30       -0.5411       6       0.975       27       -0       29       0.631       3       0.623       32       -0.1891       22       -0.270       6       0.975       31       -0.942       9       0.901       28       -0.270       6       0.975       32       -0.1891       8       0.975       27       -0.270       6       0.975       32       -0.1891
8       112       -0.136       6       0.971       1       -0.971       2       0.431       1       0.622       2       -0.371       1       0.622       2       -0.371       1       0.623       2       -0.424       1       0.623       2       -0.424       1       0.6273       1
1 18       -0.979       12       0.434       13       0.6181       2       0.520       14       -0.000       10       0.9451       10       0.398       17       -0.623       8       0.9991       17       -0.998       19       -0.901       5       0.81         1 19       -0.836       13       0.223       14       0.4581       3       0.731       15       -0.223       11       0.8661       11       0.136       18       -0.792       9       0.9991       17       -0.998       19       -0.975       6       0.91         1 20       -0.731       14       -0.4381       15       -0.223       11       0.8661       11       0.136       18       -0.9901       18       -0.975       6       0.91         1 20       -0.731       14       -0.623       13       0.6181       13       -0.975       10       0.9451       19       -0.888       21       -1.000       7       0.9451       12       -0.975       10       0.9451       20       -0.731       22       -0.975       8       0.99         1 21       -0.223       16       0.998       18       -0.782       12       -0.631
9       0       1       0       1       0       1       0       1       0       1       0       1       0       1       0       1       0       1       0       1       0       1       0       1       0       1       0       1       0       1       0       1       0       1       0       1       0       1       0       1       0       1       0       1       0       1
2 1 3 0.731 20 -0.975 21 -0.7561 10 0.398 22 -0.975 18 -0.2821 18 -0.979 25 -0.623 16 0.0951 2 0.520 27 -0.223 13 0.61 3 1 4 0.888 21 -1.000 22 -0.8661 11 0.136 23 -0.901 19 -0.4581 19 -0.388 26 -0.434 17 -0.0951 3 0.751 0 0.000 14 0.45 4 1 5 0.979 22 -0.975 23 -0.9451 12 -0.136 24 -0.782 20 -0.6181 20 -0.731 27 -0.223 18 -0.2821 4 0.888 1 0.223 15 0.28 5 1 6 0.998 23 -0.901 24 -0.9901 13 -0.398 25 -0.623 21 -0.7561 21 -0.520 0 0.000 19 -0.4581 5 0.979 2 0.434 16 0.09
5 1 5 0.978 23 -0.971 24 -0.9791 13 -0.378 23 -0.322 21 -0.7301 21 -0.2270 0 0.000 19 -0.4581 5 0.979 2 0.434 10 0.09 7 1 6 0.817 25 -0.623 26 -0.9991 14 -0.631 26 -0.434 22 -0.8661 22 -0.270 1 0.223 20 -0.6181 6 0.998 3 0.623 17 -0.09 7 1 6 0.817 25 -0.623 26 -0.9721 15 -0.817 27 -0.223 23 -0.94561 0 0.400 2 0.434 21 -0.7561 7 0.94581 8 0.623 18 -0.28 8 1 9 0.631 26 -0.434 37 -0.9101 16 -0.842 2 -0.223 23 -0.9451 0 0.400 2 0.434 21 -0.7561 7 0.94581 8 0.623 18 -0.28 8 1 9 0.631 26 -0.434 37 -0.9101 16 -0.842 2 -0.223 13 -0.9451 0 0.400 2 0.434 21 -0.7561 7 0.0945 18 -0.28 8 1 9 0.631 26 -0.434 37 -0.9101 16 -0.842 2 -0.223 13 -0.9451 0 0.400 2 0.434 21 -0.7561 7 0.0945 18 -0.28 8 1 9 0.631 26 -0.434 37 -0.9101 16 -0.842 2 -0.223 13 -0.9451 0 0.400 2 0.434 21 -0.7561 7 0.0945 18 -0.28 8 1 9 0.631 26 -0.434 37 -0.9101 16 -0.842 2 -0.223 13 -0.9451 0 0.400 2 0.434 21 -0.7561 7 0.0945 18 -0.845 18 -0.28 8 1 9 0.631 26 -0.434 37 -0.9101 16 -0.842 2 -0.000 34 -0.9451 1 0.970 3 0.623 37 -0.9451 18 -0.845 18 -0.445 18 -
9   10 0.398 27 -0.223 28 -0.815   17 -0.998 1 0.223 25 -0.999 2 0.520 4 0.732 23 -0.945 9 0.631 6 0.975 20 -0.61 0   11 0.135 0 0.000 29 -0.690 18 -0.979 2 0.434 26 -0.972 3 0.731 5 0.901 24 -0.990 10 0.398 7 1.000 21 -0.75 1   12 -0.135 1 0.223 30 -0.541   19 -0.888 3 0.623 27 -0.910 4 0.888 6 0.975 25 -0.9991 11 0.136 8 0.975 22 -0.86
I STANDS FOR THE PHYSICAL CYCLE (23 DAYS) II STANDS FOR THE EMDTIONAL CYCLE (28 DAYS) III STANDS FOR THE INTELLECTUAL CYCLE (33 DAYS)
6 JOANNE CARNER 4- 4-1939
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I       I
7       3       0.7520       21       -0.9750       10       0.7570       24       -0.4754       7       3       0.731       22       -0.9750       26       -0.4754       7       0.731       27       0.731       27       0.731       27       0.9750       26       -0.4754       7       0.731       27       0.9750       27       -0.4754       7       0.731       27       0.9750       27       -0.4754       7       0.731       2       0.423         8       4       0.888       23       -0.901       16       0.0951       12       -0.136       25       -0.623       13       0.6181       19       -0.888       0       0.001       0.9451       3       0.731       2       0.423         9       1       5       0.979       24       -0.782       17       -0.233       15       0.2621       20       -0.434       1       0.203       11       0.223       12       0.7561       5       0.979       4       0.758       2       0.434       1       0.223       12       0.424       1.623       12       0.423       1       0.223       12       0.434       1       0.223       12
4   10 0.398 1 0.223 22 -0.666 18 -0.979 4 0.782 20 -0.618 2 0.520 6 0.975 17 -0.095 10 0.398 9 0.901 15 0.28 5   11 0.136 2 0.434 23 -0.945 19 -0.808 5 0.901 21 -0.756 3 0.731 7 1.000 18 -0.282 11 0.136 10 0.782 16 0.09 6   12 -0.136 3 0.623 24 -0.990 20 -0.731 6 0.975 22 -0.866 4 0.888 8 0.975 19 -0.458 12 -0.136 11 0.623 17 -0.09 7   13 -0.398 4 0.782 25 -0.999 21 -0.520 7 1.000 23 -0.945 5 0.979 9 0.901 20 -0.618 13 -0.282 19 -0.458 12 -0.631 13 0.223 19 -0.45 8   14 -0.631 5 0.901 26 -0.972 12 -0.270 8 0.975 24 -0.990 6 0.998 10 0.782 21 -0.756 14 -0.631 13 0.223 19 -0.45 9   15 -0.617 6 0.975 27 -0.910 0 0.000 9 0.901 25 -0.999 7 0.942 11 0.623 22 -0.866 15 -0.817 14 -0.00 20 -0.61
0       116       -0.942       7       1.000       28       -0.270       10       0.782       26       -0.972       8       0.617       12       0.434       23       -0.945       16       -0.942       15       1.000       28       -0.223       21       -0.75       27       -0.910       9       0.631       13       0.223       24       -0.9991       17       -0.998       16       -0.434       22       -0.9991       18       -0.9991       17       -0.998       16       -0.434       22       -0.945       13       0.223       24       -0.99991       18       -0.9791       17       -0.623       23       -0.945       14       -0.0972       10       0.398       14       -0.9991       18       -0.9791       17       -0.623       23       -0.945       12       -0.731       12       -0.434       27       -0.9991       18       -0.731       19       -0.623       23       -0.9991       18       -0.731       19       -0.623       23       -0.9991       18       -0.731       19       -0.623       23       -0.9991       18       -0.731       19       -0.623       24       -0.9991       14       -0.000
1       21       -0.520       12       0.434       0       0.000       6       0.998       15       -0.372       13       -0.438       17       -0.623       28       -0.615       21       -0.520       20       -0.975       26       -0.97         1       22       -0.270       13       0.223       1       0.942       15       -0.434       32       -0.189       14       -0.782       29       -0.690       22       -0.270       21       -0.270       21       -0.129       1       -0.434       32       -0.189       14       -0.782       29       -0.690       30       -0.270       22       -0.270       21       -0.975       28       -0.81       19       -0.901       30       -0.541       0       0.000       22       -0.541       0       0.000       22       -0.975       28       -0.691         1       1       0.270       15       -0.434       32       -0.189       16       -0.975       31       -0.975       28       -0.691       20       -0.975       20       -0.975       31       -0.434       32       -0.975       21       -0.372       12       -0.971       23       -0.97
I STANDS FOR THE PHYSICAL CYCLE (23 DAYS) II STANDS FUR THE EMOTIDONAL CYCLE (28 DAYS) III STANDS FOR THE INTELLECIUAL CYCLE (33 DAYS)

			CAROL	MANN						
	109		2-	-194					AUGUST	
		I	(			1 14		1	11	
	17 -0.998 18 -0.782 32 -0	372 1 0.27 189 2 0.52	0 -0.975 2	-690 -541	0.631 2	-0.975	6 -0.97	0 -0.94 7 -0.99	25 -0.62	4-0.99
	1 11 -0.978 10 -0.102 32 -0 1 18 -0.979 19 -0.901 0 0 1 19 -0.888 20 -0.975 1 0	1891 4 0.88	2 -0.975 3	372 1	0 0.398 2	-0.782	8 -0.81	8 -0.97	27 -0.22	6 -0.97
	20 -0.731 21 -1.000 2 0   21 -0.520 22 -0.975 3 0	372  5 0.97 541  6 0.99	4 -0.782	1891 1	2 -0.136 2	-0.434	0 -0.54	1 -0.52	1 0.22	8 -0.81
	22-0.270 23-0.901 4 0	690 - 7 0.94 815 8 0.81	6 -0.434	.372 1	4 -0.631	0.000	0 0.000	0 0.00	4 0.78	0-0.54
	9   1 0.270 25 -0.623 6 0 0   2 0.520 26 -0.434 7 0	910  9 0.63 972  10 0.39	0 0.000	.6901 1	6 -0.942 7 -0.998	0.43	0.189	0.27	5 0.90	0 0.00
	1   3 0.731 27 -0.223 8 0 2   4 0.888 0 0.000 9 0 3   5 0.879   0.323 10 0	990  12 -0.13 990  12 -0.13	0.623	9721 1 9721 1	8 -0.979 9 -0.888 0 -0.731	0.90	0.690	0.88	0.97 10.97	0.37
	4   6 0.998 2 0.434 11 0 5   7 0.942 3 0.623 12 0	743 13 -0.37 866 14 -0.63 756 15 -0.81	0.901	9901 2	1 -0.520 2 -0.270	1.00	0.910	0.99	10 0.78	0.69
		618 17 -0.94	1.000 1	866	0-0.000-	9 0.90	666.0	8 0.81	12 0.43	0.91
	7   9 0.631 5 0.901 14 0 8   10 0.398 6 0.975 15 0	458 11 -0.97 282 18 -0.97	9 0.901 1 9 0.901 1	618	0.520 1	1 0.623	0 0.945	0 0.39	14 -0.00	66° 0 8 66° 0 8
	9   11 0.136 7 1.000 16 0 0   12 -0.136 8 0.975 17 -0	095 19 -0.88	0 0.782 1	282	0.888 1	3 0.223	2 0.756	2 -0.13	16 -0.43	0 0.94
	1   13 -0.398 9 0.901 18 -0 2   14 -0.631 10 0.782 19 -0	2821 21 -0.52	2 0.434 1 3 0.223 1	.095	0.979 1	4 -0.000	3 0.618	3 -0.39	17 -0.62	1 0.86
	3   15 -0.817 11 0.623 20 -0 4   16 -0.942 12 0.434 21 -0	618 0 0.00 756 1 0.27	4 -0.000 1	0.282	0.942 1	6 -0.434 7 -0.623	5 0.282 6 0.095	5 -0.81	19 -0.90	3 0.61 4 0.45
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XS     817     20     14     10     10     14     10       XS     136     20     14     10     10     14     10       XS     136     20     14     10     10     15     10       XS     136     20     14     10     10     15     10       XS     136     20     14     10     10     15     10       XS     136     20     14     10     10     14     10       XS     136     20     12     10     14     10     10       XS     136     20     14     10     10     10     10       XS     136     20     14     10     10     10     10       XS     136     20     14     10     10     10     10       XS     <	1 OC TO		(3)	30     30     10     10     10       10     10     10     10     10     10       10     10     10     10     10     10       10     10     10     10     10     10       10     10     10     10     10     10       10     10     10     10     10     10       10     10     10     10     10     10       10     10     10     10     10     10       10     10     10     10     10     10       10     10     10     10     10     10       10     10     10     10     10     10       10     10     10     10     10     10       10     10     10     10     10     10       10     10     10     10     10     10       10     10     10     10     10     10       10     10     10     10     10     10       10     10     10     10     10     10       10     10     10     10     10     10	I FEB
$\begin{array}{c} 0 & 434 & 19 \\ 0 & 623 & 20 \\ 0 & 782 & 21 \\ 0 & 901 & 22 \\ 0 & 975 & 23 \\ 1 & 900 & 24 \\ 0 & 623 & 28 \\ 0 & 623 & 28 \\ 0 & 623 & 28 \\ 0 & 623 & 28 \\ 0 & 623 & 28 \\ 0 & 623 & 28 \\ 0 & 623 & 28 \\ 0 & 623 & 28 \\ 0 & 623 & 28 \\ 0 & 623 & 28 \\ 0 & 623 & 28 \\ 0 & 623 & 11 \\ 0 & 623 & 12 \\ 0 & 623 & 12 \\ 0 & 623 & 11 \\ 0 & 623 & 12 \\ 0 & 633 & 12 \\ 0 & 10 & 12 \\ 0 & 10 & 12 \\ 0 & 10 & 12 \\ 0 & 10 & 12 \\ 0 & 10 & 12 \\ 0 & 10 & 12 \\ 0 & 10 & 12 \\ 0 & 10$	DBER	CAROL M		$\begin{array}{cccccccccccccccccccccccccccccccccccc$	SANDRA 6- 4 RUARY II
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16       -0.942         17       -0.998         19       -0.888         20       -0.731         21       -0.520         10       0.200         11       0.400         12       -0.942         13       0.400         14       0.888         15       -0.979         14       0.881         15       -0.979         14       -0.888         15       -0.979         14       -0.881         15       -0.998         14       -0.897         15       -0.998         16       -0.998         17       -0.998         18       -0.998         19       -0.888         20       -0.998         14       -0.898         15       -0.998         16       -0.998         17       -0.998         18       -0.998         19       -0.888         20       -0.998         21       -0.998         22       -0.998         23       -0.998         24	1			$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	I
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STANDS FOR STANDS FOR FOR FOR			ANDS     FDR       T     0       5     4       0     0       1     1       0     0       1     1       0     0       1     1       0     0       1     1       0     0       1     1       0     0       1     0       0     0       1     0       0     0       1     0       0     0 <td< td=""></td<>
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1       1
3   11 0.136 19 -0.901 29 -0.6901 19 -0.888 22 -0.975 27 -0.910 3 0.731 24 -0.782 24 -0.9901 11 0.136 27 -0.723 22 -0.86 4   12 -0.136 20 -0.975 30 -0.5411 20 -0.731 23 -0.901 28 -0.8151 4 0.888 25 -0.623 25 -0.9991 12 -0.136 0 0.000 23 -0.94 5   13 -0.396 21 -1.000 31 -0.3721 21 -0.520 24 -0.782 29 -0.6901 5 0.979 26 -0.434 26 -0.9721 13 -0.398 1 0.223 24 -0.995 6   14 -0.631 22 -0.975 32 -0.1391 22 -0.270 25 -0.623 30 -0.5411 6 0.998 27 -0.223 27 -0.9101 14 -0.631 2 0.434 25 -0.995 6   14 -0.631 22 -0.975 32 -0.1391 22 -0.270 25 -0.623 30 -0.5411 6 0.998 27 -0.223 27 -0.9101 14 -0.631 2 0.434 25 -0.995 7   15 -0.817 23 -0.901 0 0.0001 0 0.000 26 -0.444 31 -0.3721 7 0.942 0 0.000 38 -0.8151 5 0.815 15 0.000 38 -0.8151 5 0.815 15 0.815
8   16 -0.942 24 -0.732 1 0.189   1 0.270 27 -0.223 32 -0.169   8 0.817 1 0.223 29 -0.690 16 -0.942 4 0.782 27 -0.91 9   17 -0.998 25 -0.623 2 0.372   2 0.520 0 0.000 0 0.000 9 0.631 2 0.434 30 -0.541 17 -0.998 5 0.901 28 -0.81 10   18 -0.979 26 -0.434 3 0.541   3 0.731 1 0.223 1 0.189   10 0.398 3 0.623 31 -0.372   18 -0.979 6 0.975 29 -0.69 11   19 -0.888 27 -0.223 4 0.690   4 0.888 2 0.434 2 0.372   11 0.136 4 0.782 32 -0.189   19 -0.888 7 1.000 30 -0.54 12   20 -0.731 0 0.000 5 0.815   5 0.979 3 0.623 3 0.541   12 -0.136 5 0.901 0 0.000 30 -0.731 8 0.075 30 -0.54
1       -0.520       1       0.223       6       0.910       6       0.998       4       0.782       4       0.6901       13       -0.398       6       0.975       1       0.189       21       -0.520       9       0.601       32         2       -0.270       2       0.434       7       0.972       7       0.942       5       0.901       5       0.8151       14       -0.631       7       1.000       2       0.372       22       -0.270       10       0.782       0         0       0.000       3       0.623       8       0.975       6       0.9101       15       -0.817       8       0.975       3       0.5411       0       0.000       11       0.623       1         1       0.270       4       0.782       9       0.975       6       0.9121       15       -0.817       8       0.975       3       0.5411       0       0.000       11       0.623       1         1       0.270       1       0.631       7       1.9971       16       -0.942       9       0.901       1       0.270       12       0.434       2         2       0.52
18       3       0.731       6       0.975       11       0.136       9       0.901       9       0.979       11       0.623       6       0.910       3       0.731       14       0.000       12       0.626       11       0.136       9       0.901       9       0.979       11       0.623       6       0.910       3       0.731       14       0.000       4       0.623       5       0.910       3       0.731       14       0.000       4       0.623       5       0.910       3       0.731       14       0.000       4       0.623       5       0.910       3       0.731       14       0.000       4       0.623       5       0.910       3       0.731       14       0.000       4       0.623       5       0.910       3       0.731       14       0.000       4       0.634       5       0.910       3       0.731       14       0.001       4       0.623       5       0.910       3       0.731       14       0.002       4       0.634       6       0.910       3       0.731       14       0.001       4       0.623       5       0.910       3       0.731       14
21 1 6 0.998 9 0.901 14 0.4581 14 -0.631 12 0.434 12 0.7561 21 -0.520 14 -0.000 9 0.9901 6 0.948 17 -0.623 7 0.97 22 1 7 0.942 10 0.782 15 0.2821 15 -0.817 13 0.223 13 0.6181 22 -0.270 15 -0.273 10 0.9451 7 0.942 18 -0.782 8 0.99 23 1 8 0.817 11 0.623 16 0.0951 16 -0.942 14 -0.000 14 0.4581 0 0.000 16 -0.434 11 0.8661 8 0.817 19 -0.901 9 0.9901 9 0.99
24       9       0.631       12       0.434       17       -0.998       15       -0.223       15       0.2821       1       0.623       12       0.7561       9       0.631       20       -0.975       10       0.94         25       10       0.398       13       0.223       18       -0.434       16       0.0951       2       0.520       18       -0.438       10       0.398       21       -1.000       11       0.46         26       1       1       0.135       14       -0.4581       17       -0.434       16       0.0951       2       0.520       18       -0.4581       10       0.398       21       -1.000       11       0.46         26       1       11       0.135       14       -0.4581       17       -0.623       17       -0.623       12       0.4581       10       0.398       21       -1.000       11       0.465         26       1       11       0.136       14       -0.4581       19       -0.623       17       -0.6951       2       0.731       19       -0.4581       10       0.398       21       -1.000       11       0.4561       10       0.45
27   12 -0.136 15 -0.223 20 -0.618 20 -0.731 18 -0.782 15 -0.2821 4 0.688 20 -0.975 15 0.2821 12 -0.136 23 -0.901 12 0.61 28   13 -0.398 16 -0.434 21 -0.756   21 -0.520 19 -0.901 19 -0.458   5 0.979 21 -1.000 16 0.095   13 -0.398 24 -0.782 14 0.45 29   14 -0.631 17 -0.623 22 -0.366   22 -0.270 20 -0.975 20 -0.618   6 0.658 20 -0.375 15 0.2821 12 -0.398 24 -0.782 14 0.45 29   14 -0.631 17 -0.623 22 -0.366   22 -0.270 20 -0.975 20 -0.618   6 0.658 20 -0.375 15 0.2821 12 -0.398 24 -0.782 14 0.45 29   14 -0.631 17 -0.623 22 -0.366   22 -0.270 20 -0.975 20 -0.618   6 0.658 20 -0.375 15 0.005   13 -0.398 24 -0.782 14 0.45 29   14 -0.631 17 -0.623 22 -0.366   22 -0.270 20 -0.975 20 -0.618   6 0.658 20 -0.375 15 0.005   13 -0.398 24 -0.782 14 0.45 29   14 -0.631 17 -0.623 22 -0.366   22 -0.270 20 -0.975 20 -0.618   6 0.658 20 -0.375 15 0.005   13 -0.398 24 -0.782 14 0.45 29   14 -0.631 17 -0.623 22 -0.366   22 -0.270 20 -0.975 20 -0.618   6 0.658 20 -0.375 15 0.005   13 -0.398 24 -0.782 14 0.45 29   14 -0.631 17 -0.623 22 -0.366   22 -0.270 20 -0.975 20 -0.618   6 0.658 20 -0.375 15 0.005   13 -0.398 24 -0.782 14 0.45 29   14 -0.631 17 -0.623 22 -0.366   22 -0.270 20 -0.975 20 -0.618   6 0.658 20 -0.375   13 -0.398 24 -0.782   14 0.45 29   14 -0.631 17 -0.623 22 -0.366   22 -0.270 20 -0.975 20 -0.618   5 0.658 20 -0.375   14 0.658   14 0.45
30   15 -0.817 18 -0.782 23 -0.945  0 0.000 21 -1.000 21 -0.756  7 0.942 23 -0.901 18 -0.2821 15 -0.817 26 -0.434 16 0.09 31   16 -0.942 19 -0.901 24 -0.990  1 0.270 22 -0.975 22 -0.866  8 0.817 24 -0.782 19 -0.458  16 -0.942 27 -0.723 17 -0.09
40 I STANDS FOR THE PHYSICAL CYCLE (23 DAYS) 41 II STANDS FOR THE EMOTIONAL CYCLE (28 DAYS) 42 III STANDS FOR THE INTELLECTUAL CYCLE (33 DAYS)
52 53 54 55 56
DONNA YOUNG
1-29-1945
I     DAX     JANUARY     II     FEBRUARY     III     APRIL     APRIL       I     I     II     I     II     III     II     III     III
   4 0.888 9 0.901 6 0.910 12 -0.136 12 0.434 4 0.690 17 -0.978 12 0.434 32 -0.189 12 0.520 15 -0.223 30 -0.541   5 0.979 10 0.782 7 0.972 13 -0.398 13 0.223 5 0.815 18 -0.979 13 0.223 0 0.000 1 0.189 2 0.520 15 -0.223 30 -0.541   5 0.998 11 0.623 8 0.999 14 -0.631 14 -0.000 6 0.910 19 -0.838 14 -0.000 1 0.189 4 0.888 17 -0.623 32 -0.189
4 1 7 0.942 12 0.424 9 0.909 15 -0.942 16 -0.434 8 0.999 12 -0.521 15 -0.223 2 0.372 5 0.979 18 -0.762 0 0.000 6 1 9 0.631 14 -0.000 11 0.866 17 -0.942 16 -0.434 8 0.999 21 -0.520 16 -0.434 3 0.541 6 0.998 19 -0.901 1 0.189 6 1 9 0.631 14 -0.000 11 0.866 17 -0.998 17 -0.523 9 0.999 21 -0.520 17 -0.623 4 0.6901 7 0.942 20 -0.975 2 0.372
x       1       1       0.550       15       -0.520       16       -0.577       18       -0.572       10       0.000       16       -0.612       10 <t< td=""></t<>
11       14       -0.631       19       -0.901       16       0.0951       22       -0.975       14       0.4581       4       0.888       22       -0.975       9       0.9901       12       -0.136       25       -0.623       7       0.972         12       15       -0.817       20       -0.9051       0       0.000       23       -0.901       15       0.972       23       -0.975       10       0.9451       13       -0.398       26       -0.434       8       0.999         13       16       -0.942       21       -1.370       24       -0.782       16       0.995       24       -0.782       11       0.8661       14       -0.631       27       -0.223       9       0.990         13       16       -0.942       21       -1.370       24       -0.782       16       0.995       24       -0.782       11       0.8661       14       -0.631       27       -0.223       9       0.990         13       16       -0.942       21       -0.2821       1       0.270       24       -0.782       16       0.996       24       -0.782       11       0.6361       27       -0.223 </td
14   17 -0.998 22 -0.975 19 -0.458  2 0.520 25 -0.623 17 -0.095  7 0.942 25 -0.623 12 0.756  15 -0.617 0 15   18 -0.979 23 -0.901 20 -0.618  3 0.731 26 -0.434 18 -0.282  8 0.817 26 -0.434 13 0.618  16 -0.942 1 16   19 -0.886 24 -0.782 21 -0.756  4 0.848 27 -0.223 19 -0.458  9 0.631 27 -0.223 14 0.458  17 -0.998 2 16   19 -0.886 24 -0.782 21 -0.756  4 0.848 27 -0.223 19 -0.458  9 0.631 27 -0.223 14 0.458  17 -0.998 2 17   20 -0.731 25 -0.623 22 -0.866  5 0.979 0 0.000 20 -0.618  10 0.398 0 0.000 15 0.282  18 -0.979 3
1R       121       -0.520       26       -0.434       23       -0.998       1       0.223       21       -0.136       1       0.223       16       0.0951       19       -0.888       4       0.782       14       0.458         19       122       -0.270       27       -0.273       24       -0.9942       2       0.434       22       -0.434       12       -0.0951       20       -0.731       5       0.901       15       0.282         20       1       0       0.623       23       -0.9451       13       -0.232       18       -0.2621       21       -0.520       6       0.975       16       0.0955         20       1       0       0.623       23       -0.9451       13       -0.231       8       0.975       16       0.9955         20       1       0       0.623       23       -0.9451       13       -0.231       14       -0.520       6       0.975       16       0.9955         20       1       0       0.623       23       -0.9451       13       -0.232       18       -0.520       6       0.9755       16       0.9955       16       0.9955       16
21   1 0.270 1 0.273 26 -0.972  9 0.631 4 0.782 24 -0.990  14 -0.631 4 0.782 19 -0.458  22 -0.270 7 1.000 17 -0.095 27   2 0.520 2 0.434 27 -0.910  10 0.398 5 0.901 25 -0.999  15 -0.817 5 0.901 20 -0.618  0 0.000 8 0.975 18 -0.282 23   3 0.731 3 0.623 28 -0.815  11 0.136 6 0.975 26 -0.972  16 -0.942 6 0.975 21 -0.756  1 0.270 9 0.901 19 -0.458
24   4 0.888 4 0.782 29 -0.690  12 -0.136 7 1.000 27 -0.910  17 -0.998 7 1.000 22 -0.866  2 0.520 10 0.782 20 -0.618 25   5 0.979 5 0.901 30 -0.541  13 -0.398 8 0.975 28 -0.815  18 -0.979 8 0.975 23 -0.945  3 0.731 11 0.623 21 -0.756 26   6 0.998 6 0.975 31 -0.372  14 -0.631 9 0.901 29 -0.690  19 -0.888 9 0.901 24 -0.990  4 0.888 12 0.434 22 -0.866
27       1       7       0.9421       2       -0.8121       7       0.0424       2       -0.9421       2       -0.94
30   10 0.398 10 0.782 2 0.372  18 -0.979 13 0.223 0 0.000  0 0.000 13 0.223 28 -0.815  8 0.817 16 -0.434 26 -0.972 31   11 0.136 11 0.623 3 0.541  19 -0.888 14 -0.000 1 0.189  1 0.270 14 -0.000 29 -0.690  9 0.631 17 -0.623 27 -0.910
39 40 I STAWDS FOR THE PHYSICAL CYCLE (23 DAYS) 41 II STANUS FOR THE EMOTIUNAL CYCLE (29 DAYS) 42 III STANDS FOR THE INTFLLECTUAL CYCLE (33 DAYS)

MARCH II II II II II II II II II I

20     21     0.22     0.270     15     -0.434     1       21     22     0.270     16     -0.434     1       22     1     0.270     18     -0.782     1       23     1     0.270     18     -0.782     1       23     2     0.520     19     -0.901     1       24     2     0.731     20     -0.975     1       25     3     0.731     20     -0.975     1       26     4     0.888     21     -1.000     1	10 11 + 10 01	18 -0.782 11 0.86 18 -0.782 11 0.86 19 -0.901 12 0.75 20 -0.975 13 0.61	6 14 -0.631 21 - 6 15 -0.817 22 - 8 16 -0.942 23 -	.975 10 0.94	1 -0.520 23 -0 2 -0.270 24 -0
3     1     0.270     18     -0.782       4     1     2     0.520     19     -0.901       5     1     3     0.731     20     -0.975       5     4     0.688     21     -1.000     1	6 0.095 8 0.81	20 -0.975 13 0.61	8 16 -0.942 23 -		
5   3 0.731 20 -0.975 1 6   4 0.888 21 -1.000 1		21 -1.000 14 0.45	8 17 -0.998 24 -	.901 11 0.8661 .782 12 0.7561	0 0.000 25 -0
7   5 0.979 22 -0.975 2	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	22 -0.901 16 0.09 23 -0.901 16 0.09 24 -0.782 17 -0.09	51 19 -0.888 26 - 51 20 -0.731 27 -	.434 14 0.45 .223 15 0.28	0.731 0 0
9         1         7         0.942         24         -0.782         2           0         1         8         0.817         25         -0.623         2           1         1         9         0.631         26         -0.434         2	2 -0.866 14 -0.63 3 -0.945 15 -0.81 4 -0.990 16 -0.94	26 -0.434 19 -0.45 27 -0.223 20 -0.61 0 0.000 21 -0.75	8  22 -0.270 1 8  0 0.000 2 6  1 0.270 3	0.223 17 -0.0951 0.434 18 -0.2821 0.623 19 -0.4581	6 0.998 3 0. 7 0.942 4 0. 8 0.817 5 0.
I STANDS FOR THE PHYSICAL CY II STANDS FOR THE EMOTIONAL II STANDS FOR THE EMOTIONAL	YCLE (23 DAYS) CYCLE (28 DAYS) That Cycle (28 DAYS)				
II JIMMUS FOR THE INTEELE					
			-		
		KATHY MCMUL	JLLEN		
DAY I MAY II	111 1	II II	Ur I		I II Snonv
1 17 -0.998 13 0.22 1 17 -0.998 13 0.22 1 18 -0.979 14 -0.00 1 19 -0.688 15 -0.22 1 20 -0.731 16 -0.43	0.541 2 0.5 0.690 3 0.7 0.8151 4 0.8 0.9101 5 0.9	0 16 -0.434 1 0. 1 17 -0.623 2 0. 8 18 -0.782 3 0. 9 19 -0.901 4 0.	0 12 -0.136 21 0 12 -0.136 20	0.782 31 -0.37 0.975 0 0.00 0.975 0 0.00	-0.998 21 - -0.979 22 - -0.868 23 -
21 -0.520 17 -0.62 22 -0.270 18 -0.79 0 0.000 19 -0.90	0.9901 8 0.9 0.9991 7 0.9 0.99721 6 0.9	8       20       -0.975       5       0.         2       21       -1.000       6       0.         7       22       -0.975       7       0.	5 13 -0.398 22 0 14 -0.631 23 2 15 -0.817 24	0.975 2 0.37 0.901 3 0.54 0.782 4 0.69	2 -0.520 25 - 2 -0.270 26 - 0 0.000 27 -
8   1 0.270 20 -0.975 9   2 0.520 21 -1.000 0   3 0.731 22 -0.975	0 0.945  9 0.6 1 0.866  10 0.3 2 0.756  11 0.1	1 23 -0.901 8 0. 8 24 -0.782 9 0. 6 25 -0.623 10 0.	9  16 -0.942 25 0  17 -0.998 26 5  18 -0.979 27	0.623 5 0.81 0.434 6 0.91 0.223 7 0.97	0.270 0 0.520 1 0.731 2
1         4         0.888         23         -0.901           2         1         5         0.979         24         -0.782           3         1         6         0.998         25         -0.6523           4         1         7         0.942         26         -0.434	3 0.6181 12 -0.1 4 0.4581 13 -0.3 5 0.2821 14 -0.6 6 0.0951 15 -0.8	6 26 -0.434 11 0. 8 27 -0.223 12 0. 1 0 0.000 13 0. 7 1 0.223 14 0.	6  19 -0.608 6  20 -0.731 8  21 -0.520	.000 8 0.99 .223 9 0.99 .434 10 0.94	0.888 3
5 8 0.617 27 -0.223 6 9 0.631 0 0.000 7 10 0.396 1 0.223	7 -0.095 16 -0.9 8 -0.282 17 -0.9	2 2 0.434 15 0. 8 3 0.623 16 0.		.782 12 0.75 .901 13 0.61	8 0.817 7 9 0.631 8
1         10         0.396         1         0.424           8         1         1         0.136         2         0.424           9         1         12         -0.136         3         0.623           0         1         12         -0.136         3         0.623	9 -0.4581 18 -0.9 0 -0.6181 19 -0.8 1 -0.7561 20 -0.7	9 4 0.782 17 -0. 8 5 0.901 18 -0. 1 6 0.975 19 -0.	2 0.520 2 3 0.731 8 4 0.888	.975 14 0.45 .000 15 0.28 .975 16 0.09	0 0.398 9 1 0.136 10 2 -0.136 11
1         1	3 -U.9451 22 -O.2 4 -U.9901 0 0.0 5 -0.9991 1 0.2	0 3 0.975 21 -0. 0 9 0.901 22 -0.	6 6 6 0.942 1 6 0.942 1	-901 17 -0.09 -782 18 -0.28 -623 19 -0.45	5 -0.817 14 - 5 -0.817 14 -
8 0.975 9 0.901 0 0.782 1 0.623	26         -0.9721         2         0.52           27         -0.9101         3         0.73           23         -0.8151         4         0.88           29         -0.6901         5         0.977	0 11 1 12 9 14	0 9 0.631 13 9 10 0.398 14 2 11 0.136 15 0 12 -0.136 16	-0.223 21 -0.756 -0.223 21 -0.756 -0.223 23 -0.866 -0.223 23 -0.945 -0.434 24 -0.990	17       -0.999       16       -0.         18       -0.999       17       -0.         19       -0.6888       18       -0.         20       -0.731       19       -0.
9   22 -0.270  3 0.223 0   0 0.000  4 -0.000 1   1 0.270  5 -0.223	1 -0.3721 7 0.9 2 -0.1891 8 0.8 0 0.0001 9 0.6	2 16 -0.434 29 -0. 7 17 -0.623 30 -0. 1 18 -0.782 31 -0.	0  14 -0.631 18 1  15 -0.617 19 2  16 -0.942 20	.782 26 -0.97 .901 27 -0.91 .975 28 -0.81	2 -0.270 21 - 0.000 22 - 1 0.270 23 -
I STANDS FOR THE PHYSICAL C II STANDS FOR THE EMOTIONAL III STANDS FOR THE INTELLEC	CYCLE (23 DAYS) L CYCLE (28 DAYS) CTUAL CYCLE (33 DAYS	5			
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													THY	MC	KATHY MCMULLEN														
	25												11- 4-1949	4-1	949														
1 10	DAY				SEP	SEPTEMBE	m	111		1		DCTOBER II	~		111		1	NO	NUVEMBER		111		-		DEC	DECEMBER II		R	R
4 10																												1	
6	1	1 2	0.	24	-0.	782	27 -	0.9101	9	0.631	26	-0.434	+ 24		066		866.0		0.223	22 .	-0.8561	-	0	.270	ω	0.	-	623	523 19 .
7	2	- 3	0.731	1	-0.	623			10	0.399	27	-0.223	- 1		1666	18 -	.0.979	N	0.434	23.	-0.9451	N	0	520	+	0.		0.782	782 20 .
8	w	-	0.	3 26	-0.	÷	29 -	0.6901	11	0.136	0	0.000			.9721		838.0.	ω	0.623	24 .	0.990	w	0	.731	S	0.	9		
9	4	- 5		· · · ·	-0.	223	1.00	-0.5411	12	•	-	0.223	3 27	-0	1016.		0.731	4	0.782		-0.9991	4	0	888	0	0.	0		75 22 .
10	5	- 6		0		000		-0.3721	13	•	2	0.434			.812		0.520	ъ	0.901		-0.972	5	0	979	7	-	0		
11	0	- 1					32 -	0.1891	14	-0.631	ŝ	0.623	3 29		. 690	22 .	0.270	6	0.975	27 .	-0.9101	0	0	866°	8	•	0		
12	7	8		7 2	0.			0.0001	15	-0.817	4	0.78	2 30		-0.5411		0.000	7	1.000			7	0	.942		0.	9		25
13	8	6 1			0.	623		0.1891	15	-0.942		0.90	31		.3721		0.270	8		1	-0.6901	8	0	.817		0.	-		82 26 .
14	9	1 10			••	782		0.372	17			0.97	32		.1891		0.520	9		30 .	-0.5411	9	0	. 531		•	5		
15	10	- 11	0		c.	106		0.5411	10			1.000	0		0001		0.731	10			-0.3721	10	0	.39R		0.434	4		28
16	11	112	ł		0.	975.		0.690	19			0.97		1	.1091		0.838	Ξ	0.623	32	-0.189	:	0	136	- 1	0.	N		23 29 .
17	12	13				000		0.815	20	-0.731		0.90			.372		0.979	12	0.434		0.000	12	-0.	136		-0.	3		
18	13	1 14	-0	8	0.	975	6	0.9101	21			0.78			.5411	6	0.998	13	0.223		0.1891	13	-0	.398	15	10.	21		31
19	14	115			0.	901		0.9721	22	-0.270		0.62			.690	1	0.942	14	-0.000		0.3721	14	-0	.631		-0.	N	434	34 32 .
20	15	1 16		-		282		0.999	С	0.060		0.43			1918		0.817	15	-0.223		0.541	15	-0	817		-0.	5	23	
21	16	1 17	-0.998			0.623		0.9901	-	0.270		0.223	3 6		1016.0		0.631	16	-0.434	4	0.690	16	-0	.942	18	10.	1	.782	
22	17	1 18			0.			0.945	2	0.520		-0.000		1	.9721	01	965.0	17	-0.623		0.815	17	10	866		-0.901	5	01	01 2
23	18	61 1		13	0.			0.8661	S	0.731	15	-0.22			666		0.136		-0.782		0.910	18	-0.	.979	20	-0.0	0	.075	
24	19	1 20			-0.			0.7561	4	0.888		-0.434			.9901		0.136		-0.901		0.9721	19	-0	888		-1.	2	00	

III       111       111       100       100       100       100       100       100       100       100       100       1100	III 26 -0.9721 27 -0.9101 28 -0.8151 29 -0.6901 30 -0.5411 31 -0.3721 32 -0.1891 1 0.18991 1 0.18991 1 0.18991 2 0.3721 3 0.5411 3 0.5411 3 0.5411 4 0.6901 5 0.8151	I S S S S S S S S S S S S S	11 16 -0.434 17 -0.623 18 -0.901 21 -0.901 21 -0.975 21 -1.0.975 22 -0.975 23 -0.901 24 -0.782 25 -0.623 25 -0.623 26 -0.434	111 <u>24 -0.990</u> <u>25 -0.999</u> <u>25 -0.997</u> <u>26 -0.917</u> <u>27 -0.910</u> <u>28 -0.815</u> <u>29 -0.690</u>
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	6 0.554 6 0.554 6 0.91 7 -0.97 7 -0.97	3     4     0 <th><math display="block">\begin{array}{c} 16 &amp; -0.434 \\ 17 &amp; -0.623 \\ 18 &amp; -0.782 \\ 19 &amp; -0.901 \\ 20 &amp; -0.975 \\ 21 &amp; -0.975 \\ 21 &amp; -0.975 \\ 22 &amp; -0.975 \\ 23 &amp; -0.901 \\ 24 &amp; -0.782 \\ 25 &amp; -0.623 \\ 26 &amp; -0.434 \end{array}</math></th> <th>6 - 0 - 69 18 - 0 - 9 1 - 0 - 9 1 - 0 - 9 9 - 0 - 10 9 - 0 - 0 - 10 9 - 0 - 0 - 0 - 0 - 0 - 0 - 0 - 0 - 0 -</th>	$\begin{array}{c} 16 & -0.434 \\ 17 & -0.623 \\ 18 & -0.782 \\ 19 & -0.901 \\ 20 & -0.975 \\ 21 & -0.975 \\ 21 & -0.975 \\ 22 & -0.975 \\ 23 & -0.901 \\ 24 & -0.782 \\ 25 & -0.623 \\ 26 & -0.434 \end{array}$	6 - 0 - 69 18 - 0 - 9 1 - 0 - 9 1 - 0 - 9 9 - 0 - 10 9 - 0 - 0 - 10 9 - 0 - 0 - 0 - 0 - 0 - 0 - 0 - 0 - 0 -
4       8       0.817       1       0.423       1       0.001       1       0.001       1       0.223       1       0.001       1       0.223       1       0.001       1       0.270       1       0.001       1       0.270       1       0.001       1       0.270       1       0.001       1       0.270       1       0.001       1       0.270       1       0.001       1       0.270       1       0.001       1       0.270       1       0.001       1       0.270       1       0.001       1       0.270       1       0.001       1       0.270       1       0.001       1       0.270       1       0.001       1       0.270       1       0.001       1       0.270       1       0.001       1       0.270       1       0.001       1       0.001       1       0.001       1       0.001       1       0.001       1       0.001       1       0.001       1       0.001       1       0.001       1       0.001       1       0.001       1       0.001       1       0.001       1       0.001       1       0.001       1       0.001       1       0.001       1       0.001	6 0.54 6 0.69 6 0.69 6 0.69 6 0.91 1 0.18 1 0.18 6 0.91 1 0.18 1 0.18 1 0.54 1 0.18 1 0.54 1 0.54 1 0.54 1 0.55 1 0.55		19 -0,901 20 -0,975 21 -1,007 22 -0,975 23 -0,971 24 -0,782 25 -0,623 25 -0,623	9 -0.69 1 -0.91 8 -0.81
6       10       0.398       13       0.223       3       0.541       18       -0.979       16       -0.434       1       0.189       2       0.520       18       -0.78         7       11       0.136       14       -0.000       4       0.690       19       -0.888       17       -0.523       2       0.372       3       0.731       19       -0.90         8       12       -0.136       15       -0.223       5       0.815       20       -0.731       18       -0.762       3       0.541       4       0.888       20       -0.97         9       13       -0.333       16       -0.434       6       0.910       21       -0.520       19       -0.901       4       0.6901       5       0.979       21       -1.007         9       13       -0.531       17       -0.623       7       0.979       21       -0.975       5       0.815       6       0.979       21       -1.007         1       15       -0.631       17       -0.623       7       0.972       2       -0.975       5       0.815       6       0.978       22       -0.975       1       0.9	1 -0.37 2 -0.37 3 0.00 2 0.37 3 0.54 4 0.69 5 0.81 1 0.81 5 0.69 9 0.69	1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	21 -1.000 22 -0.975 23 -0.901 24 -0.782 25 -0.623 26 -0.434	9 -0.69
0       14       -0.631       17       -0.623       7       0.9721       22       -0.270       20       -0.975       5       0.815       6       0.998       22       -0.97         1       15       -0.817       18       -0.782       8       0.9991       0       0.000       21       -1.000       6       0.910       7       0.942       23       -0.97         2       16       -0.942       19       -0.9991       0       0.000       21       -1.000       6       0.910       7       0.942       23       -0.97         2       16       -0.942       19       -0.9991       0       0.000       21       -1.000       6       0.910       7       0.942       23       -0.97         2       16       -0.942       19       0.9991       0       0.270       22       -0.975       7       0.9721       8       0.817       24       -0.78         3       17       -0.975       10       0.9451       2       0.520       23       -0.9701       10       0.431       25       -0.623       10       0.9451       11       0.136       27       -0.22	0.54	4 -0.63 5 -0.81 6 -0.94	25 -0.623	0 -0.54 1 -0.37 2 -0.18
4       18       -0.979       21       -1.000       11       0.866       3       0.731       24       -0.782       9       0.9790       10       0.398       26       -0.43         5       1       19       -0.888       22       -0.975       12       0.756       4       0.888       25       -0.623       10       0.945       11       0.136       27       -0.22	0.91	7 -0.99	27 -0.22	0.18
6   20 -0.731 23 -0.901 13 0.518  5 0.979 26 -0.434 11 0.806  12 -0.136 0 0.00	0.97	8 -0.97 9 -0.88 0 -0.73	1 0.22 2 0.43 3 0.62	0.69
7   21 -0.520 24 -0.782 14 0.458  6 0.998 27 -0.723 12 0.756  13 -0.396 1 0.22 8   22 -0.270 25 -0.623 15 0.282  7 0.942 0 0.000 13 0.618  14 -0.631 2 0.43 9   0 0.000 26 -0.434 16 0.095  8 0.817 1 0.223 14 0.456  15 -0.817 3 0.62	9 0.99	2 -0.52	4 0.78 5 0.90	66 U
0   1 0.270 27 -0.223 17 -0.095  9 0.631 2 0.434 15 0.282  16 -0.942 4 0.78 1   2 0.520 0 0.000 18 -0.282  10 0.398 3 0.623 16 0.095  17 -0.998 5 0.90 2   3 0.731 1 0.223 19 -0.458  11 0.136 4 0.782 17 -0.095  18 -0.479 6 0.97	2 0.75	0.27	7 1.000 8 0.975	0 0.945
3   4 0.888 2 0.434 20 -0.618 12 -0.136 5 0.901 18 -0.282 19 -0.888 7 1.00 4   5 0.979 3 0.623 21 -0.756 13 -0.398 6 0.975 19 -0.458 20 -0.731 8 0.97 5   6 0.998 4 0.782 22 -0.866 14 -0.631 7 1.000 20 -0.618 21 -0.520 9 0.90	0.28	0.97	10 0.782 11 0.623 12 0.434	0.45
7   8 0.817 6 0.975 24 -0.990 16 -0.942 9 0.901 22 -0.866 0 0.000 11 0.62	9 -0.28	0.94	13 0.223	6 0.095
8   9 0.631 7 1.000 25 -0.999  17 -0.998 10 0.782 23 -0.945  1 0.270 12 0.43 9   10 0.398 8 0.975 26 -0.972  18 -0.979 11 0.623 24 -0.990  2 0.570 13 0.22	0 -0.61	9 0.63	15 -0.223 16 -0.434	8 -0.282
0   11 0.135 9 0.901 27 -0.910  19 -0.888 12 0.434 25 -0.999  3 0.731 14 -0.00 1   12 -0.136 10 0.782 28 -0.815  20 -0.731 13 0.223 26 -0.972  4 0.888 15 -0.22	2 -0.86	-0.13	17 -0.623 18 -0.782	0 -0.618
I STANDS FUR THE PHYSICAL CYCLE (23 DAYS) II STANDS FOR THE EMOTIONAL CYCLE (28 DAYS) III STANDS FOR THE INTELLECTUAL CYCLE (33 DAYS)				
KATHY WHITWORTH 9-27-1939				
OAX I JAMUARY II III I FEBRUARY III I MARCH	111	-	APRIL II	111
0 0.000 0 0.000 10 0.945  8 0.817 3 0.623 8 0.999  13 -0.398 3 0.62	0.541	-0.52	0.97	0.18
0.945 8 0.866 9 0.756 10 0.618 11 0.618 11 0.458 12 0.282 13 0.282 13 0.295 14	3         0.5411           4         0.6901           5         0.8151           6         0.9101           8         0.99101           9         0.9991           9         0.9991           9         0.9991	21 -0.520 22 -0.270 0 0.000 1 0.270 2 0.520 2 0.520 4 0.868	6 0.975 7 1.000 8 0.975 9 0.901 10 0.782 11 0.623 12 0.434	1 0.189 2 0.372 3 0.541 4 0.690 5 0.815 5 0.815 6 0.910 7 0.972
8       1       7       0.942       7       1.000       17       -0.0951       15       -0.817       10       0.782       15       0.2821       20       -0.731       10       0.78         9       1       8       0.817       8       0.975       18       -0.2821       16       -0.942       11       0.623       16       0.0951       21       -0.520       11       0.62         0       1       9       0.631       9       0.975       18       -0.2821       10       0.434       17       -0.9551       22       -0.270       12       0.433         0       1       10       0.398       10       0.4581       17       -0.998       12       0.434       17       -0.2821       0       0.000       13       0.223         1       10       0.398       10       0.782       20       -0.6181       18       -0.979       13       0.223       18       -0.2821       0       0.000       13       0.223         1       10       0.398       10       0.782       20       -0.6181       18       -0.979       13       0.223       18       -0.2821       0 <t< td=""><td>0.945</td><td>0.97</td><td>-0.223 -0.223 -0.434</td><td>8 0.99 9 0.94 0 0.94</td></t<>	0.945	0.97	-0.223 -0.223 -0.434	8 0.99 9 0.94 0 0.94
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	0.458	66.00 69.00 69.00 69.00 69.00 60 70 60 70 60 70 70 70 70 70 70 70 70 70 70 70 70 70	0 -0.434 7 -0.623 8 -0.782	2 0.75 3 0.61 4 0.45
4 1 2 -0.398 13 0.229 23 0.9991 22 -0.270 15 -0.434 21 -0.526 4 0.888 17 -0.623 5 1 14 -0.631 14 -0.000 24 -0.9901 22 -0.270 17 -0.623 22 -0.866 4 0.888 17 -0.62 6 1 15 -0.817 15 -0.223 25 -0.9991 0 0.000 18 -0.782 23 -0.9451 5 0.979 18 -0.78 7 1 16 -0.942 16 -0.434 26 -0.9721 1 0.270 19 -0.901 24 -0.991 6 0.998 19 -0.90	-0.095	-0.13	9 -0.901 0 -0.975 1 -1.000	4 0.45 5 0.28 6 0.09
8   17 -0.998 17 -0.623 27 -0.910   2 0.520 20 -5.975 25 -0.999   7 0.942 20 -0.97 9   19 -5.979 18 -0.782 28 -0.815   3 0.731 21 -1.000 26 -0.972   8 0.817 21 -1.00 0   19 -5.883 19 -0.901 29 -0.690   4 0.888 22 -5.975 27 -0.910   9 0.631 22 -0.97	-0.618	5 -0.81	3 -0.901 4 -0.782 5 -0.623	8 -0.28 9 -0.45
2   21 -0.520 21 -1.000 31 -0.3721 6 0.998 24 -0.762 29 -0.6901 11 0.136 24 -0.78 2   21 -0.520 21 -1.000 31 -0.3721 6 0.998 24 -0.762 29 -0.6901 11 0.136 24 -0.78	-0.945	8 -0.97 8 -0.97	5 -0.434 7 -0.223	0 -0.61
3   22 -0.270 22 -0.975 32 -0.189  7 0.942 25 -0.623 30 -0.541  12 -0.136 25 -0.62 4   0 0.000 23 -0.901 0 0.000  8 0.817 26 -0.434 31 -0.372  13 -0.398 26 -0.43 5   0 0.000 23 -0.901 0 0.000  8 0.817 26 -0.434 31 -0.372  13 -0.398 26 -0.43 5   0 0.000 23 -0.901 0 0.000  8 0.817 26 -0.434 31 -0.372  13 -0.398 26 -0.43 5   0 0.000 23 -0.901 0 0.000  8 0.817 26 -0.434 31 -0.372  13 -0.398 26 -0.43 5   0 0.000 23 -0.901 0 0.000  8 0.817 26 -0.434 31 -0.372  13 -0.398 26 -0.43 5   0 0.000 23 -0.901 0 0.900  8 0.817 26 -0.434 31 -0.372  13 -0.398 26 -0.43 5   0 0.000 23 -0.901 0 0.900  8 0.817 26 -0.434 31 -0.372  13 -0.398 26 -0.43 5   0 0.000 23 -0.901 0 0.900  8 0.817 26 -0.434 31 -0.372  13 -0.398 26 -0.43 5   0 0.000 23 -0.901 0 0.900  8 0.817 26 -0.434 31 -0.372  13 -0.398 26 -0.43 5   0 0.900 23 -0.901 0 0.900  8 0.817 26 -0.434 31 -0.372  13 -0.398 26 -0.43 5   0 0.900 23 -0.901 0 0.900  8 0.817 26 -0.434 31 -0.372  13 -0.398 26 -0.43 5   0 0.900 23 -0.900 20   0 0.900  8 0.817 26 -0.434 31 -0.372  13 -0.398 26 -0.43 5   0 0.900 20   0 0.900   0 0.900   0 0.900   0 0.900   0 0.817	-0.972	0 -0.73	0 0.000	4 -0.94
5       1       0.270       24       -0.782       1       0.691       27       -0.223       32       -0.189       14       -0.691       27       -0.22         6       1       2       0.520       25       -0.623       2       0.3721       10       0.398       0       0.000       0       0.0001       15       -0.817       0       0.00         7       1       3       0.731       26       -0.434       3       0.5411       11       0.136       1       0.223       1       0.1891       16       -0.942       1       0.22         7       1       3       0.731       26       -0.434       3       0.5411       11       0.136       1       0.223       1       0.1891       16       -0.942       1       0.22	-0.815	2 -0.27 0 0.00 1 0.27	0.434 0.623 0.782	10.01 2 -0.97 2 -0.97
1       -       0.8560       2       -0.0223       4       0.6970       12       -0.1250       2       0.434       2       0.5411       18       -0.979       3       0.62         1       5       0.979       0       0.0000       5       0.6151       13       -0.398       3       0.623       3       0.5411       18       -0.979       3       0.62         1       6       0.998       1       0.223       6       0.9101       14       -0.631       4       0.782       4       0.6901       19       -0.888       4       0.78         1       7       0.942       2       0.434       7       0.9721       15       -0.817       5       0.901       5       0.8151       20       -0.731       5       0.901	-0.372	0.73	0.97	8 -0.81 9 -0.69 0 -0.54 1 -0.37
STANDS FOR THE PHYSICAL CYCLE (23 DAYS)				
STANDS FOR THE EMOTIONAL CYCLE (28 STANDS FOR THE INTELLECTUAL CYCLF				

	)					9	4-1948						
	129	I	ANUARY I I	111	1	FEORUARY II	111	1	MARCH 11	111	1	APRIL II	111
		1       0.270       19         2       0.270       19         3       0.7520       20         4       0.8812       21         5       0.979       23         11       0       0.979       23         12       0.9979       23       19         13       0.9979       23       11         14       0.9979       23       11         15       0.9979       23       11         15       0.9979       23       11         15       0.9979       23       11         15       0.9979       13       25       10         16       0.9979       18       9       19         17       0.9979       11       10       270         18       0.9979       18       9       11         19       0.9979       18       9       11         10       10       270       14       10         10       10       11       10       11         10       11       10       11       11         11       10       11       11       11	-901 5 -975 6 -975 7 -976 7 -976 7 -978 10 -978 10 -97	815 9972 1 9972 1 8815 9990 1 9990 1 9990 1 9995 2 9990 1 9995 2 9905 2 900 2 9	Unit of the second s	X     X <td>11 VTWD</td> <td>RTH</td> <td><math display="block">\begin{array}{c} 22 \\ 23 \\ 23 \\ 24 \\ 23 \\ 20 \\ 25 \\ 24 \\ 20 \\ 25 \\ 20 \\ 20 \\ 20 \\ 20 \\ 20 \\ 20</math></td> <td></td> <td><math display="block">\begin{array}{cccccccccccccccccccccccccccccccccccc</math></td> <td>25       -0.623         27       -0.623         20       -0.623         21       -0.623         22       -0.434         20       -0.434         21       -0.623         12       -0.434         13       -0.623         22       -0.434         14       -0.762         15       -0.434         16       -0.762         21       -0.762         22       -0.434         14       -0.762         21       -0.762         22       -0.762         23       -0.762         24       -0.762         25       -0.762         24       -0.762         25       -0.762         24       -0.762         25       -0.762         24       -0.762         25       -0.762         26       -0.762         27       -0.762         28       -0.762         2975       -0.723         27       -0.723         28       -0.723         2901       -0.723         23<td></td></td>	11 VTWD	RTH	$\begin{array}{c} 22 \\ 23 \\ 23 \\ 24 \\ 23 \\ 20 \\ 25 \\ 24 \\ 20 \\ 25 \\ 20 \\ 20 \\ 20 \\ 20 \\ 20 \\ 20$		$\begin{array}{cccccccccccccccccccccccccccccccccccc$	25       -0.623         27       -0.623         20       -0.623         21       -0.623         22       -0.434         20       -0.434         21       -0.623         12       -0.434         13       -0.623         22       -0.434         14       -0.762         15       -0.434         16       -0.762         21       -0.762         22       -0.434         14       -0.762         21       -0.762         22       -0.762         23       -0.762         24       -0.762         25       -0.762         24       -0.762         25       -0.762         24       -0.762         25       -0.762         24       -0.762         25       -0.762         26       -0.762         27       -0.762         28       -0.762         2975       -0.723         27       -0.723         28       -0.723         2901       -0.723         23 <td></td>	
ω N H	±28	1	SEPTEMBE II	II	Ι	OCTUBER II	111		NOVEMBE	RIII	-	DECEMBER I I	111
5 6 7 7 8 8 9 9 9 9 11 11 11 11 11 11 11	1         1	1       13       -0.398       19         1       14       -0.631       20         1       15       -0.817       21         1       16       -0.998       23         1       17       -0.998       23         1       17       -0.998       23         1       19       -0.888       25         1       20       -0.731       26         1       21       -0.520       27         1       22       -0.520       27         1       20       -0.998       23         1       10       0.9942       28         1       10       0.9948       5         1       11       0.9942       8         1       11       0.9942       8         1       11       0.9942       8         1       11       0.9942       8         1       11       0.9942       16         1       11       0.9942       18         1       11       0.9942       17         1       12       -0.9942       18         1       14       -0.9942 <td>-0.901 22 -0.975 23 -0.975 23 -0.975 23 -0.975 23 -0.782 26 -0.782 26 -0.782 26 -0.792 16 -0.792 16 -0.792 16 -0.792 16 -0.792 16 -1.000 17 -0.975 18 -1.000 17 -1.000 17 -1.000</td> <td></td> <td>20       -0.731         21       -0.520         22       -0.270         10       0.000         20       0.270         20       0.731         4       0.688         7       0.942         8       0.631         10       -0.398         11       0.136         12       -0.398         14       -0.631         15       -0.398         14       -0.398         15       -0.398         16       -0.942         17       -0.942         18       -0.398         19       -0.631         14       -0.398         17       -0.942         18       -0.942         19       -0.398         14       -0.398         15       -0.817         18       -0.942         20       -0.398         10       -270         21       -0.520         22       -0.270         2       -0.270         2       -0.270         2       -0.270         3       0.731<!--</td--><td><math 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I     I     I     I       I     I     I     I       I     I     I     I       I     I     I     I       I     I     I     I       I     I     I     I       I     I     I     I       I     I     I     I       I     I     I     I       I     I     I     I       I     I     I     I       I     I     I     I       I     I     I     I       I     I     I     I       I     I     I     I       I     I     I     I       I     I     I       I     I     I       I     I     I       I     I     I       I     I     I       I     I     I       I     I     I       I     I     I       I     I     I       I     I     I       I     I     I       I     I     I       I     I     I       I     I       I <td>SEPTEMBE 11 12 12 14 13 14 15 10 14 10 16 10 10 10 10 10 10 10 10 10 10</td> <td>II       I         II       I         11       I         121       4       0.888         151       7       0.979         151       7       0.998         1721       9       0.631         121       8       0.979         121       9       0.631         121       9       0.631         121       9       0.631         121       9       0.631         121       9       0.631         131       14       10         141       15       -0.979         951       18       -0.9136         581       21       -0.9398         951       14       -0.631         951       15       -0.979         951       14       -0.9136         581       22       -0.270         141       5       0.979         151       7       0.942         151       7       0.942         152       0.979         153       0.4753         128       0.979         121       0.9398         130</td> <td>SUSIE MC B-27-1 B-27-1 CTOBER B-27-1 II CTOBER B-27-1 II CTOBER B-27-1 II CTOBER B-27-1 C-0.434 C-0.43</td> <td>I     I     I       1     1     1       1     1       1<td>9     1     1     1     1     1       9     1     1     1     1     1     1       9     1     1     1     1     1     1       1     1     1     1     1     1     1       1     1     1     1     1     1     1       1     1     1     1     1     1     1       1     1     1     1     1     1     1       1     1     1     1     1     1     1       1     1     1     1     1     1     1       1     1     1     1     1     1     1       1     1     1     1     1     1     1       1     1     1     1     1     1     1       1     1     1     1     1     1     1       1     1     1     1     1     1     1       1     1     1     1     1     1     1       1     1     1     1     1     1     1       1     1     1     1     1     1     1       1<td><math display="block">\begin{array}{c ccccccccccccccccccccccccccccccccccc</math></td><td>- 731 110 - 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21       -0.520       3       0.623       2       0.3721       6       0.998       6       0         22       -0.270       4       0.782       3       0.5411       7       0.942       7       1         22       -0.270       4       0.782       3       0.5411       7       0.942       7       1         0       0.0000       5       0.901       4       0.6901       8       0.817       8       0	75 0 0.0001 00 1 0.1891 75 2 0.3721	-0.398 8 0.97 -0.631 9 0.90 -0.817 10 0.78	30 -0.5411 2 31 -0.3721 2 32 -0.1891	-0.520 11 -0.270 12 0.000 13	.623 28 -0.81 .434 29 -0.69 .223 30 -0.54
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19       -0.0.888       3       0.623       27       -0.9161       4       0.888       6       0         20       -0.731       4       0.782       26       -0.8151       5       0.979       7       1         21       -0.520       5       0.901       29       -0.6910       6       0.978       8       0         22       -0.270       6       0.975       30       -0.5411       7       0.942       9       0         22       -0.270       6       0.975       30       -0.3721       8       0.817       10       0         1       0.2700       7       1.000       31       -0.3721       8       0.817       10       0         2       0.520       9       0.901       0       0.001       10       0.398       12       0         3       0.731       10       0.782       1       0.189       11       0.136       13       0         3       0.731       10       0.782       1       0.189       11       0.136       13       0	975 25 -0.9991 900 26 -0.9721 975 27 -0.9101 975 27 -0.8151 982 29 -0.8151 782 29 -0.8151 782 29 -0.5411 623 30 -0.3721 223 32 -0.1891 223 32 -0.1891		21 -0.756 22 -0.866 23 -0.945 23 -0.945 23 -0.990 24 -0.990 25 -0.999 25 -0.999 25 -0.999 25 -0.999 26 -0.972 27 -0.910 27 -0.910	-0.979 10 -0.979 10 -0.731 12 -0.520 13 -0.270 14 -0.270 15 -0.270	782 19 -0.4 623 20 -0.6 782 21 -0.6 782 22 -0.6 70.723 22 -0.8 7.000 23 -0.9 7.434 21 -0.9 7.000 23 -0.9 7.434 25 -0.9 7.434 25 -0.9
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142	РАТ BRADLEY 3-24-1951		
DAY I MAY II III	11		I I AUGUST
1       1       1       1       -0.979       12       0.434       26       -0.972       3         2       1       19       -0.888       13       0.223       27       -0.910       4         3       2       -0.731       14       -0.000       28       -0.815       5         4       21       -0.520       15       -0.223       29       -0.6900       6         5       22       -0.270       15       -0.223       30       -0.815       5         5       22       -0.270       15       -0.223       30       -0.815       5         5       22       -0.270       15       -0.223       30       -0.815       5         5       10       20000       17       -0.434       30       -0.815       5         5       10.270       18       -0.762       32       -0.189       9         7       1       0.270       18       -0.975       1       0.189       11         9       3       0.731       20       -0.975       1       0.189       11         9       3       0.731       20       -0.975	.731       15       -0.223       24       -0.9901       1         .888       16       -0.434       25       -0.9991       1         .979       17       -0.623       26       -0.9721       1         .998       18       -0.782       27       -0.9101       1         .942       19       -0.975       29       -0.6901       1         .942       19       -0.975       29       -0.6901       1         .942       19       -0.975       29       -0.6901       1         .942       19       -0.975       29       -0.6901       1         .942       19       -0.975       29       -0.6901       1         .942       12       -1.000       30       -0.541       1         .631       21       -1.007       30       -0.541       1         .398       22       -0.975       31       -0.1891       1         .136       24       -0.782       0       0.0001       1         .136       24       -0.782       0       0.0001       1         .136       24       -0.623       0       0.1691       2 <td><math display="block">\begin{array}{c} 0.398 &amp; 17 &amp; -0.623 &amp; 21 &amp; -0.\\ 0.136 &amp; 18 &amp; -0.782 &amp; 22 &amp; -0.\\ -0.136 &amp; 19 &amp; -0.901 &amp; 23 &amp; -0.\\ -0.398 &amp; 20 &amp; -0.975 &amp; 24 &amp; -0.\\ -0.617 &amp; 22 &amp; -0.975 &amp; 24 &amp; -0.\\ -0.617 &amp; 22 &amp; -0.975 &amp; 25 &amp; -0.\\ -0.942 &amp; 23 &amp; -0.901 &amp; 27 &amp; -0.\\ -0.942 &amp; 23 &amp; -0.901 &amp; -0.\\ -0.944 &amp; 20 &amp; -0.901 &amp; -0.\\ -0.944 &amp; 20 &amp; -0.901 &amp; -0.\\ -0.944 &amp; -0.944 &amp; -0.901 &amp; -0.\\ -0.944 &amp; -0.944 &amp; -0.901 &amp; -0.\\ -0.944 &amp; -0.944 &amp; -0.944 &amp; -0.\\</math></td> <td>1     1</td>	$\begin{array}{c} 0.398 & 17 & -0.623 & 21 & -0.\\ 0.136 & 18 & -0.782 & 22 & -0.\\ -0.136 & 19 & -0.901 & 23 & -0.\\ -0.398 & 20 & -0.975 & 24 & -0.\\ -0.617 & 22 & -0.975 & 24 & -0.\\ -0.617 & 22 & -0.975 & 25 & -0.\\ -0.942 & 23 & -0.901 & 27 & -0.\\ -0.942 & 23 & -0.901 & -0.\\ -0.944 & 20 & -0.901 & -0.\\ -0.944 & 20 & -0.901 & -0.\\ -0.944 & -0.944 & -0.901 & -0.\\ -0.944 & -0.944 & -0.901 & -0.\\ -0.944 & -0.944 & -0.944 & -0.\\$	1     1
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	III III .111 .282 .282 .095 .282 .095 .282 .095 .282 .095 .282 .2990 .2990 .2990 .2990 .541 .990 .541 .541 .990 .541 .541 .189 .2990 .541 .189 .2990 .541 .5		111 9900 1 9721 2 9101 2	9901       2         9101       2 <td< td=""><td>(23 DA E (28 CYCLE</td></td<>	(23 DA E (28 CYCLE
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0       0       0.888       25       0.623       24       0.9990       12       0.136       0       0.000       22       -0.866       19       -0.888       2       0.434       19       -0.458       4       0.979       6       0.975       18       -0.2         7       1       5       0.979       25       -0.9990       13       -0.398       1       0.223       23       -0.945       20       -0.731       3       0.623       20       -0.618       5       0.979       6       0.975       18       -0.2         7       1       5       0.979       25       -0.9999       13       -0.398       1       0.223       23       -0.731       3       0.623       20       -0.618       5       0.979       6       0.975       18       -0.2         7       5       0.979       25       -0.9999       13       -0.223       23       -0.731       3       0.623       20       -0.618       5       0.998       7       1.000       19       -0.434       21       -0.756       6       0.998       7       1.000       19       -0.434       21       -0.756       6       0.998<
8   6 0.998 27 -0.223 28 -0.910 15 -0.917 2 0.623 25 -0.999 22 -0.270 5 0.901 22 -0.866 7 0.942 8 0.975 20 -0.6 0   8 0.817 1 0.223 28 -0.815 16 -0.942 4 0.782 26 -0.972 0 0.000 6 0.975 23 -0.945 8 0.817 9 0.901 21 -0.7 0   8 0.817 1 0.223 28 -0.815 16 -0.942 4 0.782 26 -0.972 0 0.000 6 0.975 23 -0.945 8 0.817 9 0.901 21 -0.785 20 -0.6
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4   12 -0.136 5 0.901 32 -0.189   20 -0.731 8 0.975 30 -0.541 4 0.888 10 0.782 27 -0.910   12 -0.136 13 0.223 25 -0.9 5   13 -0.398 6 0.975 0 0.000   21 -0.520 9 0.901 31 -0.372   5 0.979 11 0.623 28 -0.815   13 -0.398 14 -0.000 26 -0.9 5   14 -0.631 7 1.000 1 0.189 27 -0.270 10 0.782 32 -0.189 6 0.998 12 0.434 29 -0.690 14 -0.631 15 -0.223 27 -0.9
7   15 -0.817 8 0.975 2 0.372  0 0.000 11 0.623 0 0.000  7 0.942 13 0.223 30 -0.541  15 -0.817 16 -0.434 28 -0.8 8 1 16 -0.942 9 0.901 3 0.541  1 0.270 12 0.434 1 0.189  8 0.817 14 -0.000 31 -0.372  16 -0.942 17 -0.623 29 -0.6
17 -0.998 10 0.782 4 0.690  2 0.520 13 0.223 2 0.372  9 0.631 15 -0.223 32 -0.189  17 -0.998 18 -0.782 30 -0.9   18 -0.979 11 0.623 5 0.815  3 0.731 14 -0.000 3 0.541  10 0.398 16 -0.434 0 0.000  18 -0.979 19 -0.901 31 -0.9   19 -0.888 12 0.434 6 0.910  4 0.888 15 -0.223 4 0.690  11 0.136 17 -0.623 1 0.189  19 -0.888 20 -0.975 32 -0.1
I STANDS FOR THE PHYSICAL CYCLE (23 DAYS) II STANDS FOR THE EMOTIONAL CYCLE (28 DAYS)
<u> 11 STANDS FOR THE INTELLECTUAL CYCLE (33</u>

DEBBIE AUSTIN 2- 1-1948
16       -0.942       12       0.434       19       -0.458       1       0.270       15       -0.223       17       -0.095       8       0.617       17       -0.623       14       0.458       16       -0.998       20       -0.998       21       -0.991       24       -0.991       25       -0.991       25       -0.
0.520       21       0.000       25       -0.690       11       0.136       25       -0.623       27       -0.910       18       -0.975       24       -0.990       3       0.731       2       0.434         0.888       23       -0.901       30       -0.5411       12       -0.398       27       -0.223       24       -0.990       3       0.731       2       0.434         0.998       25       -0.623       32       -0.136       26       -0.434       28       -0.690       20       -0.731       1       0.223       26       -0.999       4       0.888       3       0.623         0.998       25       -0.623       32       -0.817       1       0.223       31       -0.520       2       0.434       27       -0.999       4       0.888       3       0.623         0.998       25       -0.623       32       -0.817       1       0.223       31       -0.520       2       0.434       27       -0.910       6       0.991       3       0.623       28       -0.815       1       0.901       30       -0.520       7       1.000       4       0.782       2       -0.541
6 18 -0.979 9 0.901 11 0.866 3 0.731 12 0.434 9 0.990 10 0.398 14 -0.000 6 0.910 18 -0.979 17 -0.623 4 0.879 7 19 -0.888 10 0.782 12 0.756 4 0.888 13 0.223 10 0.945 11 0.136 15 -0.223 7 0.972 19 -0.888 18 -0.782 5 0.815 8 20 -0.731 11 0.623 13 0.618 5 0.979 14 -0.000 11 0.866 12 -0.136 15 -0.223 9 0.990 21 -0.520 20 -0.971 7 0.972 9 1 21 -0.520 12 0.434 14 0.458 6 0.998 15 -0.223 12 0.756 13 -0.398 17 -0.623 9 0.990 21 -0.520 20 -0.975 7 0.972 0 1 22 -0.270 13 0.223 15 0.2821 7 0.942 16 -0.434 13 0.618 14 -0.631 18 -0.782 10 0.945 22 -0.270 21 -1.000 8 0.999 1 20 -0.000 14 -0.000 16 0.095 8 0.817 17 -0.623 14 0.458 15 -0.817 19 -0.901 11 0.866 0 0.000 22 -0.975 9 0.990
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DEBBIE AUSTIN 2- 1-1948
DAVEL JANUARY I FEBRUARY II II II II II II II
0       0.398       3       0.623       30       -0.541       18       -0.975       28       -0.691       1       0.270       7       1.000       6       0.975       23       -0.945       8       0.817       9       0.901       21       -0.136         1       0.136       4       0.782       31       -0.372       19       -0.888       7       1.000       29       -0.6901       1       0.270       7       1.000       24       -0.9991       9       0.631       10       0.782       23       -0       -0.9991       10       0.398       11       0.623       23       -0.9991       10       0.398       11       0.623       23       -0.9991       10       0.398       11       0.623       23       -0.9991       10       0.398       11       0.623       23       -0.9991       10       0.398       11       0.623       25       -0.9991       10       0.398       14       -0.000       24       -0.9991       12       -0.136       13       0.223       25       -0.9991       12       -0.136       13       0.223       25       -0.9991       12       -0.136       13       0.223       25
7       16       -0.942       9       0.901       3       0.270       12       0.434       1       0.189       6       0.998       12       -0.690       14       -0.631       15       -0.223       27       -0.91         8       17       -0.998       10       0.782       4       0.6901       2       0.223       2       0.3721       7       0.942       13       0.223       30       -0.5411       15       -0.617       16       -0.434       28       -0.61         9       18       -0.979       11       0.623       5       0.8151       3       0.731       14       -0.000       31       -0.91       -0.623       29       -0.623       29       -0.623       29       -0.623       32       -0.631       15       -0.623       32       -0.631       15       -0.91       16       -0.623       29       -0.631       15       -0.631       15       -0.631       15       -0.631       15       -0.631       15       -0.631       15       -0.631       15       -0.631       15       -0.631       15       -0.631       15       -0.631       16       -0.631       15       -0.631       15
12   21 -0.520 14 -0.000 8 0.999 6 0.998 17 -0.623 6 0.910 11 0.136 17 -0.623 1 0.189 19 -0.888 20 -0.975 32 -0.18 13   22 -0.270 15 -0.223 9 0.990 7 0.942 18 -0.782 7 0.972 12 -0.136 18 -0.782 2 0.372 20 -0.731 21 -1.000 0 0.00 14   0 0.000 16 -0.434 10 0.945 8 0.817 19 -0.901 8 0.999 13 -0.398 19 -0.901 3 0.541 21 -0.520 22 -0.975 1 0.18 15   1 0.270 17 -0.623 11 0.866 9 0.631 20 -0.975 9 0.990 14 -0.631 20 -0.975 4 0.690 22 -0.270 23 -0.901 2 0.37 15   1 0.270 17 -0.623 11 0.866 9 0.631 20 -0.975 9 0.990 14 -0.631 20 -0.975 4 0.690 22 -0.270 23 -0.901 2 0.37 15   1 0.270 18 -0.782 12 0.756 10 0.398 21 -1.000 10 0.945 15 -0.817 21 -1.000 5 0.815 0 0.000 24 -0.782 3 0.54
17       3       0.731       19       -0.901       13       0.618       11       0.136       22       -0.975       11       0.866       16       -0.942       22       -0.975       6       0.910       1       0.270       25       -0.623       4       0.693         18       4       0.888       20       -0.975       14       0.458       12       -0.975       11       0.866       16       -0.942       22       -0.975       6       0.910       1       0.270       25       -0.623       4       0.693         18       4       0.888       20       -0.975       14       0.136       22       -0.975       11       0.866       16       -0.975       6       0.910       1       0.270       25       -0.623       4       0.81         19       5       0.979       21       -0.282       13       -0.631       25       -0.623       9       0.999       3       0.731       27       -0.223       6       0.97         20       1       6       0.998       22       -0.975       16       0.434       15       0.288       25       -0.623       9       0.979 <td< td=""></td<>
22   8 0.817 24 -0.782 18 -0.282 16 -0.942 27 -0.223 16 0.095 21 -0.520 27 -0.223 11 0.866 6 0.998 2 0.434 9 0.99 23   9 0.631 25 -0.623 19 -0.458 17 -0.998 0 0.000 17 -0.095 22 -0.270 0 0.000 12 0.756 7 0.942 3 0.623 10 0.94 24   10 0.398 26 -0.434 20 -0.618 18 -0.979 1 0.223 18 -0.282 0 0.000 1 0.223 13 0.618 8 0.817 4 0.782 11 0.86 25   11 0.136 27 -0.223 21 -0.756 19 -0.888 2 0.434 19 -0.458 1 0.270 2 0.434 14 0.458 9 0.631 5 0.901 12 0.75
26       12       -0.136       0       0.000       22       -0.866       20       -0.731       3       0.623       20       -0.520       3       0.623       15       0.282       10       0.398       6       0.975       13       0.618         27       13       -0.398       1       0.223       23       -0.945       21       -0.756       3       0.423       15       0.282       11       0.136       7       1.000       14       0.45         27       13       -0.631       2       0.434       24       -0.520       4       0.782       21       -0.756       3       0.423       15       0.136       7       1.000       14       0.45         29       15       -0.817       3       0.623       25       -0.9991       22       -0.866       4       0.888       5       0.901       17       -0.0951       12       -0.136       8       0.975       15       0.282       13       -0.398       9       0.901       16       0.0951       12       -0.398       9       0.901       16       0.975       18       -0.282       13       -0.398       9       0.901       16
I STANDS FOR THE PHYSICAL CYCLE (23 DAYS)
II STANDS FOR THE EMDTIONAL CYCLE (28 III STANDS FOR-THE INTELLECTUAL CYCLE-
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$\begin{array}{c} 26 & -0.972 \\ 27 & -0.910 \\ 28 & -0.815 \\ 30 & -0.541 \\ 30 & -0.541 \\ 10.189 \\ 10.189 \\ 10.189 \\ 20 & 0.910 \\ 5 & 0.815 \\ 10.189 \\ $	111	YCE KAZMIER		11       11       11       11         11       11       11       11       11         11       11       11       11       11       11         11       11       11       11       11       11       11         11	111	)YCE KAZMIE 8-14-1945
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### APPENDIX D-1

Mixed Biorhythm Cycle: Treatment Group Indices--C, Mann

Dates of	Mixed	Treatment
Tourneys	Cycle	Group*
January 31	. 205	1
February 1	.182	1
February 2	.160	1
February 7	.065	1
February 8	.037	3
February 9	.002	3
March 27	.327	1
March 28	.354	1
March 29	.353	1
April 17	.349	1
April 18	.410	1
April 19	. 443	1
April 20	. 4 4 5	1
April 25	.007	3
April 26	134	2
April 27	.271	2 2
May 2	656	2
May 3	626	2
May 4	558	2
May 23	270	2
May 24	421	2
May 25	547	2
May 29	705	2
May 30	654	2
May 31	572	2
June 1	465	2
June 6	.188	1
June 7	.293	1
June 8	.378	1
June 13	.461	1
June 14	. 420	1
June 15	. 367	1
June 27	253	2
June 28	289	2
June 29	322	2
July 4	392	2
July 5	370	2
July 6	331	2

APPENDIX D

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MIXED BIORHYTHM CYCLE: TREATMENT

GROUP INDICES

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4.

Dates of	Mixed	Treatment
Tourneys	Cycle	Group*
July 11	.114	1
July 12	.234	1
July 13	.353	1
July 25	082	2
July 26	261	2
July 27	432	2
August 15	.793	1
August 16	.720	1
August 17	.608	1 2
August 22	219	2
August 23	366	2
August 24	486	2
September 5	.263	1
September 6	.329	1
September 7	.367	1
September 19	232	2
September 20	211	2
September 21	168	2
October 17	046	2
October 18	.053	. 1
October 19	.148	1
November 14	108	2
November 15	110	2
November 16	115	2
November 21	110	
November 22	083	2
November 23	.043	1
December 5	. 409	1
December 6	.318	1
December 7	.202	1
December 13	669	1
December 14	.761	1

\*Treatment group was utilized for ANOVA.

#### APPENDIX D-2

## Mixed Biorhythm Cycle: Treatment Group Indices--S. Palmer

Dates of	Mixed	Treatment
Tourneys	Cycle	Group*
February 7	. 327	1
February 8	.140	1
February 9	045	2
March 21	249	2
March 22	300	2
March 23	344	2
March 27	368	2
March 28	325	2
March 29	262	2
April 17	299	2
April 18	386	2
April 19	449	2
April 20	482	2
April 25	227	2
April 26	119	2
April 27	008	3
May 2	.353	1
May 3	.353	1
May 4	.325	1
May 9	076	2
May 10	161	2 2
May 11	232	
May 23	.410	1
May 24	.443	1
May 25	. 445	1
May 29	.141	1
May 30	.007	3 2
May 31	134	2
June 1	274	2
June 6	656	2
June 7	626	2
June 8	558	2
June 13	.186	1
June 14	.352	1
June 15	.502	1
June 20	.739	1
June 21	.573	1
June 22	. 552	1
June 27	270	2
June 28	421	2
June 29	547	2
July 11	.188	1
July 12	.293	1
July 13	.378	1

### Mixed Biorhythm Cycle: Treatment Group Indices--S. Palmer (Continued)

Dates of	Mixed	Treatment
Tourneys	Cycle	Group*
July 25	.058	2
July 26	.003	3
July 27	047	2
August 15	.115	1
August 16	.234	1
August 17	.353	1
August 22	.696	1
August 23	.677	1
August 24	.622	1
September 5	851	2
September 6	810	2
September 7	724	2
September 12	.136	1
September 13	. 327	1
September 14	. 498	1
September 19	. 793	1
September 20	.720	1
September 21	.608	1
October 23	230	2
October 24	232	2
October 25	211	2
October 26	168	2
November 14	397	2
November 15	411	2
November 16	402	2
November 21	046	2
November 22	.053	1
November 23	.148	1
December 5	.020	3
December 6	045	2
December 7	101	2
December 13	185	2
December 14	168	2

\*Treatment group was utilized for ANOVA.

.

#### APPENDIX D-3

## Mixed Biorhythm Cycle: Treatment Group Indices--J. A. Carner

Dates of	Mixed	Treatment
Tourneys	Cycle	Group*
February 7	208	2
February 8	271	2
February 9	331	2
February 21	.267	1
February 22	.411	1
February 23	. 543	1
March 27	.897	1
March 28	.804	1
March 29	.670	1
April 17	.206	1
April 18	.292	1
April 19	.353	1
April 20	. 387	11
April 25	.231	1
April 26	.165	1
April 27	.102	1
May 2	066	2
May 3	062	2
May 4	048	2
May 9	.034	3
May 10	.031	3
May 11	.017	3
May 23	159	2
May 24	099	2
May 25	029	3
May 29	.259	1
May 30	.308	1
May 31	.339	1
June 1	. 35	1
June 6	.124	1
June 7	.044	3
June 8	.073	1
June 13	278	2
June 14	272	2
June 15	248	2
June 20	.027	3
June 21	.078	1
June 22	.117	1
June 27	.065	1
June 28	.013	3
June 29	044	3
July 11	. 270	1
July 12	.355	ĩ
July 13	. 4 2 2	1

Mixed Biorhythm Cycle: Treatment Group Indices--J. A. Carner (Continued)

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Dates of Tourneys	Mixed Cycle	Treatment Group*
July 25	612	2
July 26	701	2
July 27	753	2
August 15	.338	1
August 16	.131	1
August 17	082	2
August 22	849	2
August 23	887	2
August 24	877	2
September 5	.648	1
September 6	.665	1
September 7	.649	1
September 19	302	2
September 20	323	2
September 21	333	2
November 14	.258	1
November 15	.115	1
November 16	031	3
November 21	499	2
November 22	502	2
November 23	472	2
December 5	. 303	1
December 6	.238	1
December 7	.153	1
December 13	345	2
December 14	361	2

\*Treatment group was utilized for ANOVA.

APPENDIX D-4

Dates of	Mixed	Treatment
Tourneys	Cycle	Group*
January 31	173	2
February 1	127	2
February 2	067	2
February 7	.254	1
February 8	.280	1
February 9	.281	1
March 27	.402	1
March 28	. 556	1
March 29	.678	1
April 17	481	2
April 18	422	2
April 19	353	2
April 20	277	2
April 25	.069	1
April 26	.119	1
April 27	.162	1
May 2	.304	1
May 3	.322	1
May 4	.337	1
May 23	575	2
May 24	511	2
May 25	418	2
May 29	.151	1
May 30	.306	1
May 31	. 449	1
June 1	. 570	1
June 13	372	2
June 14	503	2
June 15	604	2
June 27	.399	1
June 28	.471	1
June 29	.508	1
July 11	344	2
July 12	332	2
July 13	300	2
July 25	.213	1
July 26	.114	1
July 27	.021	3
August 15	.566	1
August 16	.552	1
August 17	.509	1

Mixed Biorhythm Cycle: Treatment Group Indices--S. Haynie

## Mixed Biorhythm Cycle: Treatment Group Indices--S. Haynie (Continued)

Dates of	Mixed	Treatment
Tourneys	Cycle	Group *
August 22	029	3
August 23	153	2
August 24	-,265	2
September 5	007	3
September 6	.070	1
September 7	.137	1
September 19	.190	1
September 20	.175	1
September 21	.158	1
November 14	.896	1
November 15	.910	1
November 16	.876	11
November 21	.156	1
November 22	032	3
November 23	211	2
December 5	037	2
December 6	.076	1
December 7	.174	1

\*Treatment group was utilized for ANOVA.

#### APPENDIX D-5

Mixed Biorhythm Cycle: Treatment Group Indices--J. Rankin

Dates of	Mixed	Treatmen
Tourneys	Cycle	Group*
January 18	.595	1
January 19	.736	1
January 31	479	2
February 1	629	2
February 2	741	2
February 7	633	2
February 8	494	2
February 9	333	2
February 21	329	2
February 22	.213	1
February 23	.093	1
March 21	251	2
March 22	252	2
March 23	233	2
March 27	.011	3
March 28	.123	1
March 29	.172	ĩ
April 17	289	2
April 18	248	2
April 19	197	2
April 20	014	3
April 25	.095	1
April 26	.113	î
April 27	.119	1
May 2	.055	1
May 3	.045	1
May 4	.042	3
May 9	.150	1
May 10	.183	1
May 11	.211	1
May 23	485	2
May 24	550	2
May 25	630	2
May 29	416	2
May 30	290	2
May 31	140	2 2
June 1	.028	3
June 6	.788	
June 7	. 857	1
June 8	.881	1
June 13		1
	. 323	
June 14	.113	1
June 15	107	2

Mixed Biorhythm Cycle: Treatment Group Indices--J. Rankin (Continued)

Dates of	Mixed	Treatment
Tourneys	Cycle	Group*
June 20	944	2
June 21	990	2
June 22	983	2
June 27	268	2
June 28	047	2
June 29	.173	1
July 11	.186	1
July 12	.008	3
July 13	161	2
August 15	.096	1
August 16	.065	1
August 17	.024	2
August 22	264	2
August 23	317	2
August 24	360	2
September 5	.358	1
September 6	. 428	1
September 7	. 473	1
September 12	.302	1
September 13	.200	. 1
September 14	.088	1
December 5	603	2
December 6	506	2
December 7	390	2
December 13	.322	1
December 14	.390	. 1

\*Treatment group was utilized for ANOVA.

APPENDIX D-6

## Mixed Biorhythm Cycle: Treatment Group Indices--J. Blalock

Dates of	Mixed	Treatment
Tourneys	Cycle	Group*
January 31	.480	1
February 1	.542	1
February 2	. 573	1
February 7	.361	1
February 8	. 276	1
February 9	.190	1
February 21	256	2
February 22	261	2
February 23	265	2
March 21	285	2
March 22	400	2
March 23	493	2
March 27	573	2
March 28	511	2
March 29	421	2
April 17	308	2
April 18	362	2
April 19	387	2
April 20	381	2 2
April 25	008	3
April 26	.091	1
April 27	.182	1
May 2	.290	1
May 3	.229	1
May 4	.146	1
May 9	355	2
May 10	417	2
May 11	450	2
May 29	.164	1
May 30	.003	3
May 31	160	2
June 1	. 317	1
June 6	712	2
June 7	681	2
June 8	614	2
June 13	.067	1
June 14	.215	1
June 15	.348	1
June 27	0006	3
June 28	097	2
June 29	182	2

Mixed Biorhythm Cycle: Treatment Group Indices--J. Blalock (Continued)

Dates of	Mixed	Treatment
Tourneys	Cycle	Group*
July 11	208	2
July 12	174	2
July 13	-,138	2
August 22	.900	1
August 23	.911	1
August 24	.873	1
September 5	832	2
September 6	808	2
September 7	240	2
September 12	.014	3
September 13	.179	1
September 14	.326	1
September 19	.573	1
September 20	.517	1
September 21	. 433	1
November 21	.025	3
November 22	.025	3
November 23	.065	1
December 5	.064	1
December 6	.087	. 1
December 7	.117	1
December 13	.228	1
December 14	.200	1

\*Treatment group was utilized for ANOVA.

APPENDIX D-7

Mixed Biorhythm Cycle: Treatment Group Indices--D. Young

Dates of Tourneys	Mixed Cycle	Treatment Group*
January 31	.433	1
February 1	.185	1
February 2	. 216	1
February 7	272	2
February 8	308	2
February 9	317	2
March 21	102	2
March 22	178	2
March 23	2211	2
March 27	316	2
March 28	290	2
March 29	249	2
April 17	.087	1
April 18	.117	1
April 19	.150	1
April 20	.183	1
April 25	.199	1
April 26	.152	1
April 27	.087	ī
May 2	400	2
May 3	485	2
May 4	550	2
May 9	416	2
May 10	290	2
May 11	140	2
May 29	707	2
May 30	848	2
May 31	945	2
June 1	991	2
June 27	598	2
June 28	626	2
June 29	621	2
July 4	245	2
July 5	142	2
July 6	045	2
July 11	.243	1
July 12	.255	1
July 13	.255	1
August 15	.270	1
August 16	.359	1
August 17		1
AUGUSL 1/	. 428	1

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# Mixed Biorhythm Cycle: Treatment Group Indices--D. Young (Continued)

Dates of	Mixed	Treatment
Tourneys	Cycle	Group*
August 22	.386	1
August 23	.302	1
August 24	.200	1
September 5	203	2
September 6	105	2
September 7	005	2
September 19	126	
September 20	203	2
September 21	.264	1
October 17	717	2
October 18	690	2
October 19	621	2
October 23	030	3
October 24	.154	1
October 25	.332	1
October 26	. 493	1
November 14	675	2
November 15	905	2
November 16	507	2
November 21	.125	1
November 22	.232	1
November 23	.322	1
December 5	.116	1
December 6	.065	1
December 7	.016	3

\*Treatment group was utilized for ANOVA.

APPENDIX D-8

Mixed Biorhythm Cycle: Treatment Group Indices--K. McMullen

Dates of	Mixed	Treatmen
Tourneys	Cycle	Group*
January 31	.289	1
February 1	.287	1
February 2	.280	1
February 7	.091	1
February 8	.016	3
February 9	.070	1
February 21	333	2
February 22	095	2
February 23	027	3
March 21	362	32
March 22	156	2
March 23	.054	1
March 27	.714	1
March 28	.79	1
March 29	.819	1
April 17	119	2
April 18	019	3
April 19	.071	1
April 20	.144	1
April 25	.198	1
April 26	.156	1
April 27	.105	1
May 2	096	2
May 3	099	2
May 4	085	2
May 9	.129	1
May 10	.171	1
May 11	. 202	1
May 23	314	2
May 24	332	2
May 25	329	2
May 29	140	2
May 30	063	2
May 31	.016	3
June 1	.092	1
June 6	. 284	1
June 7	.271	1
June 8	. 243	1
June 13	004	3
June 14	045	2
June 15	075	2
June 20	046	2
June 21	017	3
June 22	.012	3

# Mixed Biorhythm Cycle: Treatment Group Indices--K. McMullen (Continued)

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Dates of Tourneys	Mixed Cycle	Treatment Group*
the second s		a second of the second second second
June 27	.023	3
June 28	013	3
June 29	061	2
July 4	316	2
July 5	334	2
July 6	330	2
July 11	.037	3
July 12	.161	1
July 13	.286	1
July 17	.651	1
July 18	.671	1
July 19	.653	1
July 20	. 595	1
August 15	.921	1
August 16	.824	1
August 17	.684	1
August 22	304	2
August 23	482	2
August 24	63	2
September 5	.209	1
September 6	.325	1
September 7	.417	1
September 12	. 472	1
Sepbember 13	.418	1
September 14	.352	1
September 19	.008	3
September 20	042	3
September 21	082	2
October 17	. 497	1
October 18	.502	1
October 19	.481	1
November 14	.438	1
November 15	.378	1
November 16	. 296	1
November 21	214	2
November 22	282	2
November 23	326	2
December 5	.345	1
December 6	.328	1
		1
December 7	.281	1

\*Treatment group was utilized for ANOVA.

### APPENDIX D-9

Mixed Biorhythm Cycle: Treatment Group Indices--K. Whitworth

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Dates of	Mixed	Treatment
Tourneys	Cycle	Group*
January 18	844	2
January 19	859	2
January 31	.783	1
February 1	.813	1
February 2	.801	1
February 7	.243	1
February 8	.0823	1
February 9	075	2
February 21	246	2
February 22	158	2
February 23	074	2
April 17	567	2
April 18	667	2
April 19	727	2
April 20	746	2
April 25	278	2
April 26	116	2
April 27	.047	1
May 9	.026	3
May 10	094	2
May 11	200	2
May 23	.235	1
May 24	.282	1
May 25	.305	1
May 29	.134	1
May 30	.042	3
May 31	056	2
June 1	155	2
June 13	.206	1
June 14	.313	1
June 15	.403	1
June 20	. 449	1
June 21	.372	1
June 22	.374	1
June 27	302	2
June 28	387	2
June 29	449	2
July 25	.095	1
July 26	.077	1
July 27	.055	1
August 15	.120	1
August 16	.267	1
August 17	.411	1

Mixed Biorhythm Cycle: Treatment Group Indices--K. Whitworth (Continued)

Dates of	Mixed	Treatment
Tourneys	Cycle	Group*
August 22	.796	1
August 23	.763	1
August 24	.687	1
September 5	957	2
September 6	890	2
September 7	775	2
September 12	.235	1
September 13	. 444	1
September 14	.628	1
September 19	.897	1
September 20	.804	1
September 21	.670	1
October 23	037	3
October 24	058	2
October 25	066	2
October 26	062	2
November 14	206	2
November 15	159	2
November 16	099	2

\*Treatment group was utilized for ANOVA.

APPENDIX D-10

Mixed Biorhythm Cycle: Treatment Group Indices--S. Post

Dates of Tourneys	Mixed Cycle	Treatment Group*
January 18	290	2
January 19	311	2
January 31	.063	1
February 1	.066	ī
February 2	.062	1
February 7	.057	1
February 8	.075	1
February 9	.101	1
February 21	.017	3
February 22	090	2
February 23	205	2
March 21	048	2
March 22	272	2
March 23	483	2
March 27	988	2
March 28	992	2
March 29	095	2
April 17	.054	1
April 18	108	2
April 19	254	2
April 20	377	2
April 25	539	2
April 26	487	2
April 27	415	2
May 2 May 3	.075 .125	1
May 4	.125	1
May 9	.176	1
May 10	.166	1
May 11	.158	1
May 23	.039	3
May 24	018	3
May 25	082	2
May 29	334	
May 30	373	2
May 31	396	2 2 2
June 1	398	2
June 6	099	2
June 7	.003	3
June 8	.107	1
June 13	.452	1
June 14	. 453	1
June 15	. 428	1

# Mixed Biorhythm Cycle: Treatment Group Indices--S. Post (Continued)

Dates of	Mixed	Treatment
Tourneys	Cycle	Group*
June 20	.009	3
June 21	094	2
June 22	187	2
June 27	346	2
June 28	304	2
June 29	242	2
July 11	099	2
July 12	012	3
July 13	753	2
July 25	.280	1
July 26	.183	1
July 27	. 495	1
August 15	435	2
August 16	266	2
August 17	080	2
August 22	.734	1
August 23	.807	1
August 24	.837	1
October 17	322	2
October 18	232	2
October 19	125	2
November 14	493	2
November 15	332	2
November 16	154	2
November 21	.621	1
November 22	.690	1
November 23	.717	1
December 5	499	. 2
December 6	502	2
December 7	473	2

\*Treatment group was utilized for ANOVA.

#### APPENDIX D-11

Mixed Biorhythm Cycle: Treatment Group Indices--S. McAllister

Dates of	Mixed	Treatment
Tourneys	Cycle	Group*
January 31	717	2
February 1	785	2
February 2	810	2
February 7	332	2
February 8	154	2
February 9	.031	3
February 21	.143	1
February 22	010	3
February 23	156	2
March 21	297	2
March 22	304	2
March 23	285	2
March 27	.005	3
March 28	.105	1
March 29	.201	1
April 25	.304	1
April 26	.357	· 1
April 27	.389	1
May 2	.264	1
May 3	.203	1
May 4	.141	1
May 9	096	2
May 10	119	2
May 11	134	2
May 23	255	2
May 24	243	2
May 25	216	2
May 29	.045	1
May 30	.142	1
May 31	.245	1
June 1	.347	1
June 13	186	2
June 14	364	2
June 15	530	2
June 20	886	2
June 21	823	2
June 22	714	2
June 27	.268	1
June 28	.478	1
June 29	.664	1
July 4	.944	1
July 5	.848	1
June 6	.707	1

# Mixed Biorhythm Cycle: Treatment Group Indices--S. McAllister (Continued)

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Dates of	Mixed	Treatment
Tourneys	Cycle	Group*
July 11	323	2
July 12	512	2
July 13	669	2
July 25	.761	1
July 26	.749	1
July 27	. 512	1
August 15	150	2
August 16	112	2
August 17	087	2
August 22	055	2
August 23	071	2
August 24	088	2
September 5	.249	1
September 6	.290	1
September 7	.316	1
September 12	.178	1
September 13	.102	1
September 14	.019	3
September 19	334	2
September 20	358	2
September 21	360	2
October 17	005	3
October 18	.066	1
October 19	.139	1
October 23	.317	1
October 24	.308	1
October 25	.272	1
October 26	.210	1
November 14	.633	1
November 15	.740	1
November 16	.809	1
November 21	. 479	1
November 22	.299	1
November 23	.100	1
December 5	424	2
December 6	233	2
December 7	034	3

\*Treatment group was utilized for ANOVA.

### APPENDIX D-12

## Mixed Biorhythm Cycle: Treatment Group Indices--J. Washam

Dates of	Mixed	Treatmen
Tourneys	Cycle	Group*
January 31	.648	1
February 1	.766	1
February 2	.845	1
February 7	. 542	1
February 8	.362	1
February 9	.159	· 1
February 21	481	2
February 22	295	2
February 23	097	2
March 27	004	3
March 28	.036	3
March 29	.075	1
April 17	267	2
April 18	374	2
April 19	467	2
April 20	542	2
April 25	491	2
April 26	390	2
April 27	265	2
May 2	. 453	1
May 3	. 558	ī
May 4	.632	ĩ
May 23	234	2
May 24	107	2
May 25	.021	3
May 29	. 380	1
May 30	. 403	ĩ
May 31	. 394	ī
June 1	.356	1
June 13	229	2
June 14	145	2
June 15	046	2
June 27	.016	3
June 28	118	2
June 29	249	2
July 11	.145	1
July 12	.286	1
July 13		
	. 412	1 2
July 25	166	
July 26	278	2
July 27	371	2

Mixed Biorhythm Cycle: Treatment Group Indices--J. Washam (Continued)

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Dates of	Mixed	Treatment
Tourneys	Cycle	Group8
August 15	.258	1
August 16	.268	1
August 17	. 277	1
August 22	.280	1
August 23	.265	1
August 24	.239	1
September 5	617	2
September 6	623	2
September 7	598	2
September 19	.874	1
September 20	.872	1
September 21	.823	1
November 14	.105	1
November 15	.050	1
November 16	002	3
November 21	085	2
November 22	057	2
November 23	018	3
December 5	016	3
December 6	090	2
December 7	161	2
December 13	307	2
December 14	266	2

\*Treatment group was utilized for ANOVA.

APPENDIX D-13

Mixed Biorhythm Cycle: Treatment Group Indices--C. J. Skala

Dates of	Mixed	Treatment
Tourneys	Cycle	Group*
January 31	502	2
February 1	472	2
February 2	412	2
February 7	.119	1
February 8	.214	1
February 9	. 288	1
March 21	497	2
March 22	390	2
March 23	262	2
April 17	358	2
April 18	320	2
April 19	276	2
April 20	229	2
May 23	71	2
May 24	639	2
May 25	531	2
May 29	.158	1
May 30	.351	1
May 31	.530	1
June 1	.687	1
June 6	.855	1
June 7	.603	1
June 8	. 598	1
June 27	.433	1
June 28	. 564	1
June 29	.658	1
July 4	. 525	1
July 5	.403	ī
July 6	.266	1
July 11	335	2
July 12	390	2
July 13	416	2
July 25	.147	1
July 26	.130	1
July 27	.099	1
September 5	.190	1
September 6	.213	1
September 7	.215	1
September 12	.077	1
September 13	.038	3
September 14	.004	3

Mixed Cycle	Treatment Group*
004	3
.025	3
.058	1
.639	1
.726	1
.775	1
.543	1
.386	1
	Cycle 004 .025 .058 .639 .726 .775 .543

\*Treatment group was utilized for ANOVA.

### APPENDIX D-14

Mixed Biorhythm Cycle: Treatment Group Indices--P. Bradley

Dates of	Mixed	Treatmen
Tourneys	Cycle	Group*
January 31	.205	1
February 1	.340	1
February 2	.382	1
February 21	716	2
February 22	626	2
February 23	502	2
March 21	168	2
March 22	063	2
March 23	.042	3
March 27	. 303	1
March 28	.306	1
March 29	. 282	1
April 25	.074	1
April 26	051	2
April 27	174	2
May 2	525	2
May 3	515	2
May 4	478	2
May 9	018	3
May 10	.087	1
May 11	.182	1
May 23	.086	1
May 24	.039	3
May 25	003	3
May 29	107	2
May 30	124	2
May 31	142	2
June 1	161	2
June 6	283	2
June 7	303	2
June 8	316	2
June 13	166	2
June 14	084	2
June 15	.013	3
June 20	.55	3
June 21	.622	1
June 22	.667	1
June 27	.375	1
June 28	.22	1
June 29	.045	1
July 11	442	2
July 12	236	2
July 13	016	3

Dates of	Mixed	Treatment
Tourneys	Cycle	Group*
July 25	. 372	1
July 26	.161	1
July 27	054	2
August 15	.535	1
August 16	.529	1
August 17	. 494	1
August 22	.084	1
August 23	.0003	3
August 24	071	2
September 5	012	3
September 6	016	3
September 7	030	3
September 19	.025	3
September 20	.090	1
September 21	.156	1
October 17	.138	1
October 18	.172	1
October 19	.189	1
October 23	.090	1
October 24	.038	3
October 25	016	3 3
October 26	067	2 3
November 14	.014	3
November 15	114	2
November 16	245	2
November 21	660	2
November 22	647	2
November 23	595	2
December 5	.864	1
December 6	.800	1
December 7	.691	1 2
December 13	462	2
December 14	635	2

\*Treatment group was utilized for ANOVA.

Mixed Biorhythm Cycle: Treatment Group Indices--A. Alcott

Dates of	Mixed	Treatmen
Tourneys	Cycle	Group*
January 31	434	2
February 1	377	2
February 2	298	2
February 7	.202	1
February 8	.274	1
February 9	.323	1
February 21	284	2
February 22	278	2
February 23	245	2
April 17	276	2
April 18	120	2
April 19	.035	3
April 20	.172	1
April 25	.581	1
April 26	.577	1
April 27	.548	1
May 2	.087	1
May 3	.006	3
May 4	067	2
May 9	286	2
May 10	306	2
May 11	319	2
June 6	.138	1
June 7	02	3
June 8	184	2
June 13	786	2
June 14	810	2
June 15	792	2
June 20	146	2
June 21	.047	1
June 22	.237	1
June 27	.817	1
June 28	.812	1
June 29	.762	1
July 11	651	1 2
July 12	604	2
July 13	524	2
July 25	.330	1
July 26	.253	1
July 27	.162	1
August 22	315	2
August 23	378	2
August 24	418	2

Dates of Tourneys	Mixed Cycle	Treatment Group*
September 5	.405	1
September 6	.436	1
September 7	. 443	1
September 12	.169	1
September 13	.082	1
September 14	004	3
September 19	272	2
September 20	281	2
September 21	275	2
October 17	.402	1
October 18	.357	1
October 19	.288	1
November 14	.827	1
November 15	.686	1
November 16	.508	1
December 5	.534	1
December 6	.656	1
December 7	.738	1

\*Treatment group was utilized for ANOVA.

APPENDIX D-16

Mixed Biorhythm Cycle: Treatment Group Indices--B. Cullen

Dates of	Mixed	Treatment
Tourneys	Cycle	Group*
January 18	.603	1
January 19	.533	1
January 31	333	2
February 1	333	2
February 2	326	2
February 7	237	2
February 8	213	2
February 9	184	2
March 27	.114	1
March 28	030	3
March 29	169	2
April 17	.237	1
April 18	.153	1
April 19	.056	1
April 20	045	2
May 9	. 420	1
May 10	.119	1
May 11	.214	1
May 23	390	2
May 24	262	2
May 25	119	2
May 29	. 422	1
May 30	.512	1
May 31	.572	1
June 1	.602	1
June 13	.351	1
June 14	387	2
June 15	405	2
June 20	276	2
June 21	228	2
June 22	181	2
June 27	. 024	3
June 28	.060	1
June 29	.097	1
July 4	.304	1
July 5	.344	1
July 6	.378	1
July 11	.349	1
July 12	.286	1
July 13	.202	1
August 15	604	2
August 16	750	2
August 17	853	2

### Mixed Biorhythm Cycle: Treatment Group Indices--B. Cullen (Continued)

Dates of	Mixed	Treatment
Tourneys	Cycle	Group*
August 22	651	2
August 23	488	2
August 24	303	2
September 5	.402	1
September 6	.265	1
September 7	.122	1
September 12	390	2
September 13	416	2
September 14	412	2
September 19	107	2
September 20	030	2
September 21	.037	1
October 17	.221	1
October 18	.167	1
October 19	.101	1
October 23	201	2
October 24	260	2 2
October 25	304	
October 26	329	2
November 14	.037	3 3 3
November 15	.004	3
November 16	020	3
November 21	.025	3
November 22	.057	1
November 23	.090	1
December 5	379	2
December 6	433	2
December 7	466	2

\*Treatment group was utilized for ANOVA.

#### APPENDIX D-17

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Mixed Biorhythm Cycle: Treatment Group Indices--J. Bourassa

Dates of	Mixed	Treatmen
Tourneys	Cycle	Group*
January 31	.360	1
February 1	.317	1
February 2	.264	1
February 7	024	2
February 8	065	2
February 9	096	2
February 21	247	2
February 22	255	2
February 23	255	2
March 21	867	2
March 22	900	2
March 23	886	2
April 17	857	2
April 18	881	2
April 19	857	2
April 20	788	2
April 25	028	3
April 26	.140	1
April 27	.290	1
May 2	. 590	1
May 3	.550	1
May 4	.485	ī
May 9	002	3
May 10	085	2
May 11	152	2
May 23	042	3
May 24	045	2
May 25	055	2
May 29	115	2
May 30	119	2
May 31	113	2
June 1	095	2
June 6	.140	1
June 7	.197	1
June 8	.248	· 1
June 13	. 288	1
June 14	.241	1
June 15	.178	1
June 27	243	2
June 28	172	2
June 29	093	2

## Mixed Biorhythm Cycle: Treatment Group Indices--J. Bourassa (Continued)

Dates of	Mixed	Treatment
Tourneys	Cycle	Group*
July 11	.015	3
July 12	046	2
July 13	100	2
July 25	.300	1
July 26	.316	1
July 27	.307	1
August 15	.333	1
August 16	.494	1
August 17	.633	1
August 22	.741	1
August 23	.629	1
August 24	. 479	1
September 5	736	2
September 6	595	2
September 7	424	2
September 12	.506	1
September 13	.637	1
September 14	.230	1
September 19	.603	1
September 20	.481	1
September 21	.342	1
October 17	.272	1
October 18	.302	1
October 19	.328	1
October 23	.363	1
October 24	.342	1
October 25	.305	1
October 26	.251	1
November 14	.243	1
November 15	.388	1
November 16	.514	1

\*Treatment group was utilized for ANOVA.

#### APPENDIX D-18

### Mixed Biorhythm Cycle: Treatment Group Indices--S. Roberts

Dates of	Mixed	Treatment
Tourneys	Cycle	Group*
January 31	.043	3
February 1	043	3
February 2	124	2
February 7	313	2
February 8	298	2
February 9	269	2
February 21	.056	1
February 22	.050	1
February 23	.046	1
June 6	.164	1
June 7	.149	1
June 8	.123	1
June 13	150	2
June 14	218	2
June 15	281	2
June 20	377	2
June 21	335	2
June 22	273	2
June 27	. 207	1
June 28	.171	1
June 29	.371	1
July 11	265	2
July 12	323	2
July 13	356	2
July 25	.262	1
July 26	.247	1
July 27	.208	1
August 15	.536	1
August 15	. 564	1
August 17	. 557	1
August 22	.025	3
August 23	140	2
August 24	304	2
September 5	.112	1
September 6	.300	1
September 7	.472	1
September 12	.821	1
September 13	.762	1
September 14	.663	1
November 14	.714	1
November 15	.718	1
November 16	.685	1

## Mixed Biorhythm Cycle: Treatment Group Indices--S. Roberts (Continued)

Dates of Tourneys		Mixed Cycle	Treatment Group*	
November	21	.043	3	
November	22	136	2	

\*Treatment group was utilized for ANOVA.

#### APPENDIX D-19

## Mixed Biorhythm Cycle: Treatment Group Indices--D. Austin

Dates of	Mixed	Treatment
Tourneys	Cycle	Group*
February 21	323	2
February 22	208	2
February 23	364	2
March 21	073	2
March 22	.041	3
March 23	.162	1
March 27	.536	1
March 28	.295	1
March 29	.557	1
April 17	.112	1
April 18	.300	1
April 19	.469	1
-	. 620	1
April 20 April 25	.763	<u>1</u>
		1
April 26	.664	
April 27	.531	1
May 2	464	2
May 3	578	2
May 4	659	2
May 9	538	2
May 10	432	2
May 11	311	2
May 23	.386	1
May 24	.349	1
May 25	.307	1
May 29	.124	1
May 30	.078	1
May 31	.032	3
June 1	016	3
June 6	281	2
June 7	334	2
June 8	383	2
June 20	.262	1
June 21	.390	1
June 22	. 506	
July 4	311	1 2
July 5	473	2
		2
July 6	610	2
July 11	730	
July 12	629	2
July 13	493	2
July 25	. 556	1
July 26	. 436	1
July 27	.295	1

Mixed Biorhythm Cycle: Treatment Group Indices--D. Austin (Continued)

Dates of	Mixed	Treatment
Tourneys	Cycle	Group*
August 15	.315	1
August 16	.302	1
August 17	.264	1
August 22	136	2
August 23	209	2
August 24	264	2
September 5	.405	1
September 6	. 427	1
September 7	.420	1
September 12	.028	3
September 13	088	2
September 14	200	2
November 14	.313	1
November 15	.161	1
November 16	008	3
November 21	791	2
November 22	868	2
November 23	901	2
December 5	.924	1
December 6	.984	· 1
December 7	.991	1

\*Treatment group was utilized for ANOVA.

APPENDIX D-20

Mixed Biorhythm Cycle: Treatment Group Indices--J. Kazmierski

Dates of	Mixed	Treatment
Tourneys	Cycle	Group*
January 31	.317	1
February 1	.389	1
February 2	. 448	1
February 7	.407	1
February 8	.324	1
February 9	.219	1
March 21	.091	1
March 22	.182	1
March 23	.255	1
March 27	.290	1
March 28	.229	1
March 29	.146	1
April 17	. 623	1
April 18	.634	1
April 19	.606	1
April 20	.541	1
April 25	160	2
April 26	317	2
April 27	457	2
May 2	681	2
May 3	614	2
May 4	514	2
May 9	.215	1
May 10	.348	1
May 11	.459	1
May 23	097	2
May 24	182	2
May 25	251	2
May 29	369	2
May 30	364	2
May 31	350	2
June 1	328	2
June 6	174	2
June 7	138	2
June 8	099	2
June 13	.165	1
June 14	.231	1
June 15	.298	1
June 20	.512	1
June 21	.503	1
June 22	.470	1
June 27	046	2
June 28	194	2
June 29	342	2

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#### Mixed Biorhythm Cycle: Treatment Group Indices--J. Kazmierski (Continued)

Dates of	Mixed	Treatment
Tourneys	Cycle	Group*
July 4	795	2
July 5	783	2
July 6	730	2
July 11	.034	3
July 12	.233	1
July 13	. 424	1
August 22	.210	1
August 23	272	2
August 24	307	2
September 5	.165	1
September 6	.141	1
September 7	.100	1
September 12	192	2
September 13	230	2
September 14	251	2
September 19	067	2
September 20	.011	3
September 21	.093	1
November 14	300	2
November 15	400	2
November 16	2185	2
November 21	511	2
November 22	416	2
November 23	.290	1
December 5	.668	1
December 6	.511	1
December 7	.323	1
December 13	848	2
December 14	944	2

\*Treatment group was utilized for ANOVA.

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