TEXT-BOOK
ON
DIRECTIONAL CALCULTIONS

M. VIJAYA RAGHAVULU

TEXT-BOOK

ON

DIRECTIONAL CALCULATIONS

SYSTEMATISED BY COMPREHENSIVE, EXHAUSTIVE
AND UNIVERSAL RULES,
WITH
PRECISE AND COPIOUS TABLES

BY

M. VIJAYA-RAGHAVULU, B.A., M.B. & C.M.,

Author of " Text-Book on Mathematical Astrology ", " Century Tables of Houses " and " Hindu Astrological Calculations (Modernised)".

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FOREWORD

No book treats the subject in a **comprehensive** and **exhaustive** manner giving the rules of **universal** application to be adopted in the several stages of the different Directional Calculations, though Directions are pre-eminent for judging nativities. In this book I have endeavoured to do so, and, therefore, to render all Directional Calculations **lucid.** It is for the reader to judge how far I have succeeded in my attempt.

I have raised certain questions in regard to some kinds of Directions, such as Converse Directions of all kinds, Primary Mundane Directions to the Horizon, Primary Zodiacal Directions, and Directions of the Angles. I trust the reader will agree with me in my **contentions.**

To complete my "Century Tables of Houses", its Part IV for latitudes 61° to 66° 33′ is already being printed and is expected to be published before the current year ends. The Essentials of Hindu Judicial Astrology is also in the Press, and it may be published even earlier.

140, BROADWAY,
MADRAS,
20th September 1933.

M. VIJAYA-RAGHAVULU.

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TO THE

MEMORY

OF

MY BELOVED PATERNAL GRAND-FATHER,

M. RANGA PILLAI.

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LESSON I—INTRODUCTION

1. The Standard Nativity—Mathematical subjects are best taught when they are illustrated with solved problems exemplifying the various principles. As it would conduce to the better understanding of the subject to take a single horoscope to illustrate all the calculations, I propose to take up that of George V for the purpose. He was born in Marlborough House, London, 51° 20′ N. geocentric latitude, and 0 hour 0 minute 37 seconds W. longitude, at 1-18 A.M., G. M. T., on Saturday, June 2/3, 1865. And for the purpose of providing exercises to be worked out by the reader, I shall take up the horoscope of one born at 12° 59′ N. geocentric latitude, and 5 hours 21 minutes E. longitude, at 8-41 A.M., L. M. T., on Wednesday, December 13, 1871, which will be referred to as the standard nativity.

2. Zodiacal Positions of Bodies—The zodiacal position of a body is its position in the ecliptic circle, and is expressed by the two co-ordinates, the celestial longitude and celestial latitude. The determination of the zodiacal positions of bodies at birth, is discussed in Lesson IV of my Text-book on Mathematical Astrology. They are known as the **radical positions.** Let us agree to state longitudes in degrees and minutes reckoned from the First Point of Aries, dropping the names of the zodiacal signs, e.g., 207° 46′ for 27 ♎ 46. The zodiacal positions of celestial bodies at George V's birth were as :—

Body	Long.	Lat.	Body	Long.	Lat.	Body	Long.	Lat.
☉	72° 26′	0° 0′	♀	39° 39′	1° 29′ S.	♄	204° 6′	2° 39′N.
☾	181 3	2 27 S.	♂	125 35	1 26 N.	♅	88 37	0 12 N.
☿	48 29	3 17 S.	♃	265 40	0 26 N.	♆	10 10	1 30 N.

Exercise (1)—Find the zodiacal positions of all the bodies in the standard nativity.

3. The Zodiacal Positions of Cusps of Houses—The zodiacal cusps or the first points of the zodiacal houses have only longitudes and no latitude, being ecliptic points. The determination of the zodiacal cusps is fully gone into in Lesson V of my Text-book on Mathematical Astrology. They are also found readily worked out in my Century Tables of Houses in which all the non-angular,

namely, the second, third, twelfth and eleventh, as well as the angular, namely, the first and tenth cusps, are given correct to the first place of decimal, for every integral minute of sidereal time, that is, for every fifteen minutes of arc in R.A.M.C. The R.A.M.C. at George V's birth was 270° 51′ 33″, and the geocentric latitude of the birth place was 51° 20′ N. The longitudes of the cusps at R.A.M.C. 270° 51′ 33″, and for N. geocentric latitude 51° 20′ as given in Century Tables of Houses are :—

Cusp	Long.	Cusp	Long.
X	270° 47·3′	I	2° 2·7′
XI	289 7·2	II	48 41·2
XII	313 40·8	III	72 36·6

Exercise (2)—Find the longitudes of the cusps of houses in the standard nativity.

4. Zodiacal Map—The zodiacal positions of bodies and of cusps at a birth are best presented in the form of a map of the heavens at the moment.

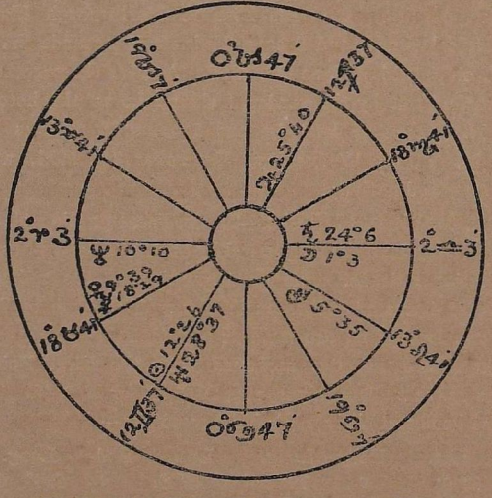


Fig. I—The Zodiacal Map at George V's birth.

Exercise (3)—Erect the zodiacal map of the heavens for the standard nativity.

5. Mundane Positions of Bodies—The mundane position of a body is its position in the heavens in relation to a particular birth place on Earth. It may be stated in one of two ways, (1) by the angular distance at which the body is from its nearer meridional half, which is spoken of as its upper meridional distance (U.M.D.) or its lower meridional distance (L.M.D.), or (2) by the angular distance at which the body is either forwards (anti-clockwise) from the cusp of

its mundane house, termed the **cuspal distance forwards** (C.D.F.), or backwards (clockwise) from the cusp of its next anti-clockwise house, termed the **cuspal distance backwards** (C.D.B.) The determination of the radical mundane positions is dealt with in the latter part of Lesson VI of my Text-book on Mathematical Astrology. To find these positions, the R.A.'s, the declinations and the semi-arcs of bodies have to be first determined, which is gone into in the former part of Lesson VI of my Text-book on Mathematical Astrology. The determination of the mundane cusps is included in the above solution. The mundane positions of the bodies in George V's nativity are :—

Body	M. D.	Position.	Body	M. D.	Position.	Body	M. D.	Position.
♆	80° L 57′	I 5° 44′	☉	19° L 54′	II 19° 32′	☾	89° L 7′	VI 26° 54′
♀	53 L 9	I 19 41	♃	2 L 22	III 16 34	♄	67 U 36	VII 13 46
☿	43 L 55	II 3 49	♂	37 L 28	V 16 38	♅	5 U 35	IX 13 46

Exercise (4)—Find the mundane positions of all the bodies in the standard nativity.

6. Combined Mundane Map—The mundane positions of bodies have not till the publication of my Text-book on Mathematical Astrology been presented in the form of a map, because each body has its own set of twelve mundane houses, the R. A's. of whose cusps, except the tenth, vary. So, each body has its own mundane map, and consequently the whole set of mundane maps is omitted as being not feasible. This omission necessitates the calculation of mundane directions with the aid of zodiacal maps. Such a practice necessarily gives rise to much confusion, and leads to errors and oversights in directional calculations. For example, Mercury in George V's nativity is in the first zodiacal house but in his second mundane house (see Fig. I and II). Should we elect to omit the degrees and minutes in the R.A.'s of the cusps of the mundane houses of different bodies, and to give only their C.D.F.'s in the mundane houses occupied by them, we can erect a single combined mundane map with the mundane positions of all bodies shown in it. Such a combined mundane map will be helpful in working out mundane directions, as will be seen presently in the discussion of mundane directions. So I have designed one on the lines indicated above, which is given on Page 5 for George V's nativity.

Exercis (5)—Erect the combined mundane map for the standard nativity.

7. Speculum.—The celestial longitudes, the celestial latitudes, the right ascensions, the declinations, the meridional distances, the semi-arcs, the mundane house-spaces, the cuspal distances, and the horizontal distances of the different bodies when determined may be entered in a tabular statement called the **speculum**, for ready reference in directional calculations. The speculum for George V's nativity is given in Schedule I below.

Exercise (6)—Prepare the speculum for the standard nativity,

SCHEDULE—I

Speculum of Bodies taken with their Latitude.

51° 20′ N. Geoc. Lat.
0 h. 0 m. 37s. W. Long.

George V.

1—18 a. m. G. M. T.
Saturday, 2-3 June, 1865.

Body.	Long.	Lat.	R. A.	Decl.	M. D.	S. A.	H. S.	C. D.	H. D.
♆	10° 10′	1 S 30	9° 55′	2 N 39	80 L 57	86 N 41	28 N 53·7	5 F 44 I 23 B 10 II	5 E 44
♀	39 39	1 S 29	37 43	13 N 17	53 L 9	72 N 50	24 N 16·7	19 F 41 I 4 B 36 II	19 E 41
☿	48 29	3 S 17	46 57	14 N 10	43 L 55	71 N 36	23 N 52·0	3 F 49 II 20 B 3 III	27 E 41
☉	72 26	0 0	70 58	22 N 18	19 L 54	59 N 9	19 N 43·0	19 F 32 II 0 B 11 III	39 E 15
♅	88 37	0 N 12	88 30	23 N 39	2 L 22	56 N 48	18 N 56·0	16 F 34 III 2 B 22 IV	54 E 26
♂	125 35	1 N 26	128 20	20 N 17	37 L 28	62 N 29	20 N 49·7	16 F 38 V 4 B 11 VI	99 E 57
☾	181 3	2 S 27	179 59	2 S 40	89 L 7	93 N 20	31 N 6·7	26 F 54 VI 4 B 13 VII	182 E 27
♄	204 6	2 N 39	203 16	6 S 51	67 U 36	81 D 22	27 D 7·3	13 F 46 VII 13 B 21 VIII	13 W 46
♃	265 40	0 N 26	265 17	22 S 56	5 U 35	58 D 4	19 D 21·3	13 F 46 IX 5 B 35 X	52 W 29
Asc.	2 3	0 0	1 53	0 N 49	91 U 1	91 D 1	30 D 20·3	On cusp I	(0 E 0)
M. C.	270 47	0 0	270 52	23 S 27	0 U 0	57 D 9	19 D 3·0	On cusp X	(91 E 1)

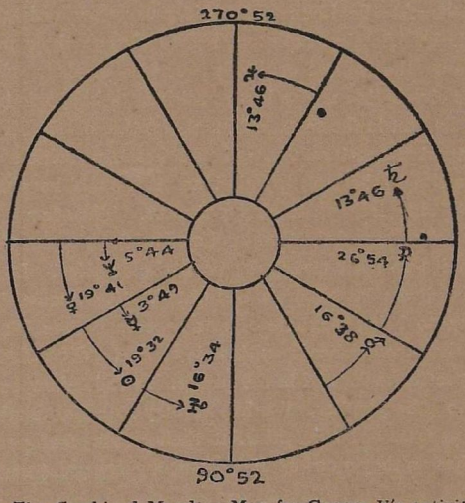


Figure II—The Combined Mundane Map for George V's nativity.—The figures are the C.D.F.'s of the bodies.

8. Zodiacal and Mundane Aspects—All about the determination of all the zodiacal aspects and parallels and of all the mundane aspects and parallels between the several pairs of bodies, are very fully set out in Lesson VII of my Text-book on Mathematical Astrology. The reader is strongly recommended to master the subject, else he will feel a great deal of difficulty in understanding the subject of directional calculations. In fine, the subject of aspect determination is the foundation on which rests the problem of calculating directions.

In George V's nativity all the Zodiacal Aspects are :—

☾ S ∥ ♆ ☾ A □ ☿ ☉ A ∥ ♅ ♂ A □ ♀ ♃ S ♂ ♅
☾ S □ ♅ ☿ A ± ♃ ☉ A ∥ ♃ ♂ A ∥ ☉ ♃ A ∥ ♅
☾ S □ ♃ ☿ S ∥ ♀ ☉ S ⚺ ♀ ♀ A ⚺ ♆ ♅ S △ ♄
☾ A ± ♀ ☉ S ✶ ♆ ☉ S ✶ ♂ ♀ A □ ♃
☾ A ⚺ ♂ ☉ A △ ♄ ♂ A △ ♆ ♃ A ✶ ♇

Exercise (7)—Determine all the zodiacal aspects in the standard nativity.

And all the Mundane Aspects in George V's nativity are :—

☾ ∥ ♆ ☾ A ± ☿ ☉ A △ ♄ ♂ A ∠ ♄ ♀ A ✶ ♅
☾ A □ ♅ ☿ A ⚺ ♆ ☉ A □ ♄ ♂ S ✶ ♄ ♀ S △ ♃
☾ S □ ♃ ☿ S ✶ ♅ ☉ S ⚺ ♅ ♂ A ✶ ♅ ♃ S ♂ ♅
☾ S ⚻ ♀ ☿ A □ ♄ ☉ S ⚺ ♀ ♂ S △ ♃ ♃ A ✶ ♄
☾ S ⚺ ♂ ☿ ∥ ♂ ☉ S □ ♂ ♂ A △ ♀ ♅ S △ ♄
☾ A △ ☉ ☉ A ✶ ♆ ♂ S □ ♆ ♀ S ♂ ♄

Exercise (8)—Determine all the mundane aspects in the standard nativity.

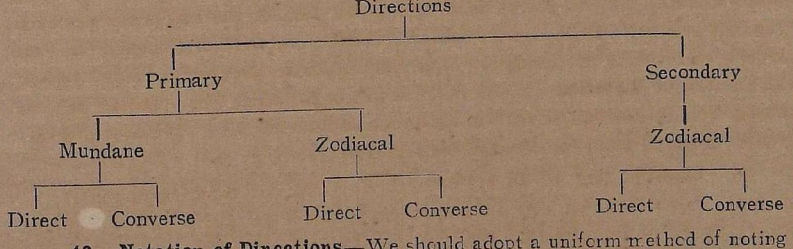
± Signifies the Biquintile aspect.

9. Directions—At the birth of a child a very few radical aspects stand completed (see Art. 8). As time rolls on, bodies change their positions and are brought to aspects of the radical or birth positions of their own and those of other bodies. This dislocation of the birth positions of bodies is brought about by two phenomena. The first is the eastward axial rotation of the Earth, appreciated by us as the apparent diurnal rotation of the heavens, which causes celestial bodies to appear to rise in the east, to culminate at the mid-heavens, and to set in the west, and so to shift from their birth positions. The second is the eastward annual motions of bodies round the Sun, and of the Moon round the Earth, which causes celestial bodies to shift eastwards or anti-clockwise. In either case the mundane positions of bodies at birth are dislocated. The change in the positions of bodies necessary to bring them into new aspects of the birth positions of other bodies or of their own radical positions is termed a **direction.** Therefore, a direction is an aspect to be formed in the future. In radical aspects we note the aspects of bodies to other bodies, all taken as they stood at birth, but in directions we note the aspects of bodies taken at their subsequent positions to themselves or other bodies as they stood at birth or at a subsequent moment.

10. The Five Elements of a Direction—In every direction there are five elements. (1) The body that is moved is known as the **directed body** (D.B.). Any one of the seven planets, Mercury, Venus, Mars, Jupiter, Saturn, Uranus and Neptune, and of the two luminaries, the Sun and Moon, and only in one case of the two Angles, the meridian and the horizon, may be the D. B. (2) The body or the angle to an aspect of whose position the directed body is moved is called the **stationary position** (S. P.). The S. P. may be any one of the nine bodies and the two angles. (3) The aspect directed to is the **aspect of direction,** and its **angular extent** (A.E.) is measured from the stationary position towards the D. B. (4) The point where the aspect directed to falls is termed the **limit.** The limit may be to the anti-clockwise or clockwise side of the stationary position. The only stage of aspect recognised in directions is that of Complete or Full Aspect, there being no direction to the Application or Separation of an Aspect. (5) The **arc of direction** (A. D.) is the arc through which the directed body is moved from its position at birth to form an aspect of the S. P. The arc of direction is measured from the directed body towards the S. P.

11. Classification of Directions—A direction has three features, (1) the natural phenomenon on which the direction rests, (2) the circle upon which the aspect extent of the direction and the arc of the direction are measured, and (3) the course of the direction. The classification of directions is based upon these features. (i) Directions are classified, in the main, into two groups, **primary** and **secondary,** according to the natural phenomenon underlying them. A **pri-**

mary direction is one which rests on the apparent diurnal rotation of the heavens: and a **secondary direction** is one which rests on the annual revolution of bodies. (ii) Primary directions are also divided into **mundane** and **zodiacal** ones, according as the aspect extent of direction is measured upon the equator or the ecliptic. **Primary mundane directions** are those in which the aspect extents of directions are measured upon the equatorial circle: and **primary zodiacal directions** are those in which the aspect extents of directions are measured upon the ecliptic circle. But secondary directions are all zodiacal, as the aspect extents of directions are always measured upon the ecliptic. (iii) A primary or secondary direction may be **direct or converse**, according as the course of direction is in consonance with or contrary to what obtains in nature. A body is said to move **anti-clockwise** in a circle when it moves against the hands of a watch, and **clockwise** when it moves with the hands of a watch. In primary mundane directions, a direction in which the D.B. is moved clockwise is said to be a **direct direction**, as the clockwise course of direction is in consonance with the natural apparent clockwise rotation of bodies in the heavens; and one in which the D.B. is moved anti-clockwise is said to be a **converse direction**, as the anti-clockwise course of direction is opposed to what apparently obtains in nature. But in primary zodiacal directions and in secondary directions, one in which the D.B. is moved anti-clockwise is said to be a **direct direction**, since the anti-clockwise course of direction is in consonance with the anti-clockwise annual motion of bodies; and one in which the D.B. is moved clockwise is said to be a **converse direction**, since the clockwise course of direction is opposed to the natural anti-clockwise annual motion of bodies. All the above diverse classes of directions may be presented in the form of a pedigree as shown below. I propose to discuss the claims of these several groups of directions to be adopted in practice, taking each group in its proper place.



12. Notation of Directions—We should adopt a uniform method of noting directions, as it would avoid confusion. So, the symbol of the directed body is written first, next the symbol of the aspect of direction, and lastly the symbol of the stationary position, that is, the body or angle to whose aspect the direction

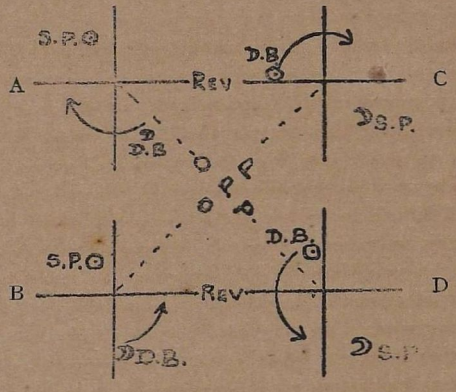
is made, e.g., ☉ * ☾ which means that the Sun is directed to the Sextile aspect of the Moon. And the word 'direct' or 'converse' along with the name of the class of directions, e.g., 'primary mundane', 'primary zodiacal' or 'secondary' are also mentioned.

13. The Rules framed are Exhaustive, Comprehensive and Universal—In books on Directions, primary directions to fractional aspects, such as the quintile, are ignored, on the score that they are not of much significance, and those to aspects other than the conjunction and the opposition of the two Angles are usually omitted, as they are considered to be of little or no consequence. But they seem to be omitted especially because the formulæ and rules for calculating the arcs of directions become necessarily complicated and difficult. So I have framed rules under each class of directions, that would be applicable to all cases alike. Also, no attempt has been made in books to determine the very first primary direction after birth between all possible pairs of bodies, nor to work out the entire series of all the subsequent directions. On the other hand, directions are chosen at present by inspection and guess-work, and very meagre rules of no universal application are followed. But the rules that I have framed are exhaustive, comprehensive and of universal application, and so are scientific, and will help one to determine all directions to fractional as well integral aspects, from the very first moment after birth to any period of life.

14. Measurement of Time—The time when the effects of a direction are said to be realised in life, is always at a period later than the time when the direction will stand completed. Every four minutes after birth in primary directions, and every day after birth in secondary ones is made to measure to one year in life. Therefore, only such directions as could operate within the probable limits of life, such as 75 or 80 or 90 years, need be calculated.

15. Reverse and Opposite Directions—In books on Directions the expressions 'reverse direction' and 'opposite direction' are used rather indiscriminately. It would be better to restrict either of them to particular classes of directions which have no definite names. Two directions may be said to be the **reverse** of one another when they are both alike direct or converse with the directed body and the stationary position in one as the stationary position and the directed body in the other. And two directions may be said to be the **opposite** of one another when one is direct and the other converse with the directed body and the stationary position in one as the stationary position and the directed body in the other. That is, in each pair of both reverse and opposite directions, the D.B. and S.P. exchange their places, but while a pair of directions which are the reverse of one another are both alike direct or converse, a pair of directions which are the opposite of one another are contrary in their course, one being direct and the other

converse. For example, if the directions illustrated in Figure III are taken to be primary ones, then A and C are both direct primary ones which are the Reverse of one another, and B and D are both converse primary ones which are the Reverse of



(A) (i) Direct primary or
(ii) Converse Secondary.
(B) (i) Converse Primary or
(ii) Direct Secondary.

(C) (i) Direct Primary or
(ii) Converse Secondary.
(D) (i) Converse Primary or
(ii) Direct Secondary.

Fig. III—Directions between the same two bodies.—D B., the directed body; S.P. the stationary position; and the arrow mark indicates the course of direction.

one another. Whereas A and D are the Opposite of one another, and B and C are likewise the Opposite of one another. Again, if the directions illustrated in Figure III are taken to be secondary ones, then A and C are both converse secondary ones which are the Reverse of one another, and B and D are both direct secondary ones which are the Reverse of one another. Whereas A and D are the Opposite of one another, and B and C are likewise the Opposite of one another. The directions portrayed in Figure III viewed separately as (i) primary and (ii) secondary ones, may be noted in conformity with the principle laid down in Article 12 as set forth hereunder. It may also be noted that A and B are the converse of one another, and so are C and D.

(A) (i) ☽ △ ☉ dir. Prim. Mund. (ii) ☽ △ ☉ con. sec.
(B) (i) „ con. „ (ii) „ dir. „
(C) (i) ☉ △ ☽ dir. „ (ii) ☉ △ ☽ con. „
(D) (i) „ con. „ (ii) „ dir. „

16. Are Converse Directions Admissible?—To state the question in general terms, are directions of bodies contrary to what obtains in nature possible? Converse directions are unnatural; and so they are incontestably impossible. In

fact, they are repugnant to our scientific sense. However, we shall examine the two different arguments advanced in support of them. Firstly, converse directions are held to be pre-natal, that is, to have been completed before birth. This is a only a specious reason. For, how can aspects completed when the native had no individuality bear any fruit in his life after he had acquired individuality by birth? In fact, birth is the very first moment in an individuals's life, and the positions of bodies and their aspects at birth are rightly held to be radical positions and aspects. Besides, the body directed to or the stationary position attains its position at birth only at birth, but not at a pre-natal moment. So, there can be no direction to a point at which the body directed to has not yet arrived. Secondly, converse directions are held to be what really obtains in nature, in that the real phenomenon is the anti-clockwise axial rotation of the Earth, but not the clockwise diurnal rotation of the heavens, and that, consequently, while bodies remain fixed in the heavens (but for their small annual motion), it is the Earth and so the mundane houses of bodies that sweep anti-clockwise past the bodies. Such indeed is the case. But as it is highly inconvenient to picture to ourselves what really obtains in nature, and to base all observations and calculations on the real nature of the phenomenon, it was elected to go by the apparent phenomenon of the clockwise diurnal rotation of the heavens, and to base all observations and calculations on such a view of affairs. Should we, notwithstanding the great strain that would be thrown on our powers of conception, choose to hold to the real phenomenon, then all methods of calculations should be reversed. For, ecliptic points will rise in the west and set in the east and, the semi-arcs and cuspal distances of ecliptic points taken with no latitude, instead of those of celestial bodies taken with latitude will have to be calculated. So we may adopt either phenomenon, the real or the apparent. **But not both.** If we choose to go by the real phenomenon, then what are known now as direct directions will become impossible, and all methods of calculation should be thoroughly reversed, and such a course would render all observations highly impracticable. But if we decide to go by the apparent phenomenon, then what are known now as converse directions will become impossible, and all methods of calculation may remain as in vogue, and such a course would render all observations practicable. Hence, to calculate the arcs in converse directions without reversing the methods of calculation is flagrant outrage to reason. For these reasons, we ought to adopt the clockwise apparent diurnal rotation of the heavens and the anti-clockwise annual motion of bodies, and base all calculations upon them, and unreservedly rule out the practice of admitting both converse and direct directions, and what is worse, of calculating the arcs in converse directions without reversing the methods of calculation.

Contention I —Converse Directions are Inadmissible.

PART I

PRIMARY DIRECTIONS

17. Primary Directions—Primary directions rest upon the apparent phenomenon of the clockwise diurnal rotation of the heavens, due to the anti-clockwise axial rotation of the Earth. In consequence, celestial bodies appear to us to be moving clockwise in the heavens, every one at the same rate of motion as that of the Earth's axial rotation. The common rate of motion of all bodies is 360 equatorial degrees in 24 sidereal hours; and so one degree is rotated in 4 sidereal minutes. One equatorial degree or 4 sidereal minutes measures to one year of life. So all primary directions that could bear fruit during the first ninety years of an individual's life are completed within the first six sidereal hours (or 5 hours and 59 minutes of meantime) after birth. Hence, primary directions are all speedily formed and speedily dissolved within the first six sidereal hours of life. As one degree is rotated in 4 minutes, and as one degree measures to one year of life, so an error of about 4 minutes in the birth-time of an individual will not only shift the positions especially of fast moving bodies and points, such as the Moon and the Angles, but will also produce an error of about one year in the periods to which the directions measure. Consequently, the precise moment of birth should be carefully ascertained. Primary directions are so called because they are completed first in point of time after birth as compared with secondary directions. As a celestial body has both a mundane and a zodiacal position, two classes of primary directions are recognised at present, (1) those to the mundane aspects of the radical bodies and angles, called **primary mundane directions**, and (ii) those to the zodiacal aspects of the radical bodies and angles, called **primary zodiacal directions**. In primary mundane directions the arcs of directions are always measured upon the equator: while in primary zodiacal directions they are measured first upon the ecliptic and then referred to the equator.

LESSON II

PRIMARY MUNDANE DIRECTIONS

18. Primary Mundane Directions—Primary mundane directions may be viewed to be **direct or converse. Direct primary mundane directions** are those in which the directed body is moved clockwise; and **converse primary mundane directions** are those in which the directed body is moved anti-clockwise. The path of direction is along the equator. Only a celestial body can be the directed body (D.B.), and only an angle or the radical position of a body can be the stationary position (S.P.). In primary mundane directions D.B. is directed to a mundane aspect of the position of only an angle or radical body. As there are nine bodies and eleven positions, so we have 9× 11 or 99 groups of primary mundane directions, with the same D.B. and S.P. in each group. And as there are twelve aspects—Conjunction, semi-sextile, semi-quintile, semi-square, Sextile, quintile, Square, Trine, sesqui-square, bi-quintile, quincunx and Opposition—leaving aside the Parallel, we obtain 99× 12 or 1188 possible primary mundane directions. Since the heavens are perpetually rotating clockwise, every celestial body is dislocated clockwise [anti-clockwise]* from its radical mundane position, that is, from I house to XII, XII to XI [XI house to XII, XII to I] and so on, reaching first the cusp of its own mundane house [the cusp of its next anti-clockwise house] and next the cusps of its successive clockwise [anti-clockwise] houses till it arrives at its clockwise [anti-clockwise] horizon and rises or sets, and finally arrives at its own radical mundane position after 24 sidereal hours or one sidereal day. During this clockwise [anti-clockwise] rotation of the D.B., its clockwise [anti-clockwise] distance from every one of the eleven radical positions or the S.P.'s, continuously changes. The change may be an increase or decrease. Primary mundane directions may be calculated by adopting the mundane position as expressed by mundane distance or cuspal distance. The former will not be adopted as it will apply only to cases of conjunction and opposition, and the latter will be adopted as it will apply to cases of all aspects alike.

19. Clockwise and Anti-clockwise Distances from D.B. to S.P—Two bodies on a circle will always have two arcs or distances between them. Each distance will be clockwise to only one of the two bodies, and anti-clockwise to the other. For example, in Figure IV the arcs A M B and B N A are the

*The expressions within braces [ ] apply throughout to the cases of converse directions.

two distances between A and B, of which A M B is clockwise to A, and anti-clockwise to B: and B N A is clockwise to B, and anti-clockwise to A. To find the clockwise distance from a D.B. to an S.P., deduct the mundane position of the S.P. from that of the D.B. (see Mathematical Astrology, Lesson VII, end of Art. 130). But the easiest method is to add (i) the C.D.F. of the D.B., (ii) the integral number of mundane houses running clockwise between the house of the D.B. and that of the S.P., and (iii) the C.D.B. of the S.P. moderated to the S.A. of D.B. at birth as follows, taking all arcs as they stood at birth :—

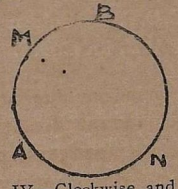


Fig. IV.—Clockwise and Ati-clockwise distances

Birth S.A. of S.P. : its C.D.B. : : birth S.A. of D.B. : moderated C.D.B. of S.P.

Dictum I—Take all arcs as they stood at birth, in calculating distances.

For example, to obtain the mundane clockwise distance from Juptier, ix 13° 46′ to Saturn, VII 13° 46′, first moderate the C.D.B. of Saturn to the birth S.A. of Jupiter, the birth S.A. of Saturn being 81° 22′, its C.D.B. 13° 21′, and the birth S.A. of Jupiter, 58° 4′, proceed as follows :—

81° 22′; 13° 21′ : : 58° 4′, : the C.D.B. of Saturn mod. to the birth S.A. of Jupiter. (A. C.) 9·65517 + 1·12979 + 0·49135 = 1·27631, T.P.L. of 9° 32′, (mod. C.D.B. of ♃). Therefore, the mundane clockwise distance from Jupiter (D.B.) to Saturn (S.P.) is 13° 46 + i + 9° 32′, i.e., i 23° 18′.

Now, if the right ascensional degrees and minutes so obtained, is less than one house-space of the D.B. as it stood at birth, retain it as it is; but if it is greater, then deduct one house-space from the degrees and minutes obtained and add one to the number of integral houses. In the above example, 23° 18′ is greater than 19° 21′, one diurnal house-space of Jupiter, so deduct 19° 21′ from 23° 18′, and add one to i, and we obtain ii 3° 57′ as the mundane clockwise distance from Jupiter to Saturn. Again, the clockwise distance from the Sun to Mercury is 19° 32′ + xi + 16° 34′, the C.D.B. of Mercury moderated to the Sun (see Sch. II), i.e., xi 36° 6′; and 19° 43′ is one nocturnal house-space of Sun. So xi 36° 6′ is equivalent to xii 16° 23′ which is to be taken as the clockwise distance from the Sun to Mercury.

The anti-clockwise distance from a D.B. to an S.P. is readily had, being nothing but the explement of the clockwise distance, i.e., xii mundane houses minus the clockwise distance. But to find the anti-clockwise distance independently of the clockwise distance, reverse the above method., i.e., deduct the mundane position of the D.B. from that of the S.P. But as before, the easiest method is to add (i) the C.D.B. of the D.B., (ii) the integral number of mundane houses running anti-clockwise between the house of the D.B. and that of the S.P., and (iii) the

C.D.F. of the S.P. moderated to the birth S.A. of D.B. as follows :—

Birth S.A. of S.P. : its C.D.F. : : birth S.A. of D.B. : moderated C.D.F. of S.P. For example, to obtain the mundane anti-clockwise distance from Jupiter (D.B.), ix 13° 46′, to Saturn (S.P.) VII 13° 46′, first moderate the C.D.F. of Saturn to the birth S.A. of Jupiter, the birth S.A. of Saturn being 81° 22′, its C.D.F. 13° 46′ and the birth S.A. of Jupiter, 58° 4′, proceed as follows :—

81° 22′ : 13° 46′ : : 58° 4′ : C.D.F. of Saturn mod. to the birth S.A. of Jupiter. (A.C.) 9·65517 + 1·11644 + 0·49135 = 1·26296, T.P.L. of 9° 49′, mod. C.D.F. of ♃. Therefore, the mundane anti-clockwise distance from Jupiter to Saturn is 5° 35′ + ix + 9° 49′, i.e., ix 15° 24′ ; and as 15° 24′, the degrees and minutes obtained is less than 19° 21′, one diurnal house-space of Jupiter, we retain it as it is, and take the sum as the mundane anti-clockwise distance from Jupiter to Saturn. But if the degrees and minutes in the sum were greater than one appropriate house-space of the D.B., then deduct the latter from the former, and add one to the integral number of houses in the sum, as stated above. Again, the anti-clockwise distance from Neptune to Venus is 23° 10′ + xi + 23° 26′ the C.D.F. of Venus moderated to Neptune (see Sch. II), i.e., xi 46° 36′, and 28° 54′ is one nocturnal house-space of Neptune. So xi 46° 36′ is equivalent to xii 17° 42′ which becomes the anti-clockwise distance from Neptune to Venus. Therefore, we have

Rule I—The clockwise distance (Cl. D.) from D.B. to S.P. is C.D.F. of D.B. + the number of clockwise mundane houses between D.B.'s and S.P.'s houses + the C.D.B. of S.P. moderated to S.A. of D.B. at birth : and the anti-clockwise distance (Acl. D) from D.B. to S.P. is C.D.B. of D.B. + the number of anti-clockwise mundane houses between D.B.'s and S.P.'s houses + the C.D.F. of S.P. moderated to S.A. of D.B. at birth.

Rule II—When the degrees and minutes in the clockwise or the anti-clockwise distance exceed one house-space of D.B. at birth, deduct the house space from the Cl. D. or Acl. D. and add one to the number of houses in the Cl. D. or Acl. D. If not, retain the Cl. D or Acl. D as it is.

Rule III—The moderation of C.D.B. [C.D.F.] of S.P. is as follows ;—

Birth S.A. of S.P. : its C.D.B. [C.D.F] : : birth S.A. of D.B. : mod. C.D.B. [C.D.F.]

20. The Shorter Distance between D.B. and S.P.—The clockwise distance is required in the calculations of the direct mundane directions, and the anti-clockwise distance in those of the converse mundane directions. As all aspect extents are less than the extent of vi mundane houses, we always require arcs less than vi houses. If either the clockwise distance or the anti-clockwise distance found as described in the previous article, is less than vi mundane houses, then it is also the **shorter distance**. But if it is greater than vi mundane houses, then rectify it by deducting it from xii mundane houses to obtain the shorter distance, which

may now be termed the **rectified shorter distance.** To facilitate subtraction of mundane distances, instead of xii mundane houses take xi mundane houses plus one house-space of the D.B. at birth. For example, as shown in the previous article, the clockwise distance from Jupiter to Saturn being ii 3° 57′, it is taken, as it is, as the shorter distance. But the anti-clockwise distance from Jupiter to Saturn, as shown in the previous article, is ix 15° 24′, and it is greater than vi mundane houses, and so has to be rectified by deducting it from xii houses, i.e., xi houses + 19° 21′, which latter is one diurnal house-space of Jupiter. Therefore, the rectified shorter distance from Jupiter to Saturn is xi 19° 21′—ix 15° 24′, i.e., ii 3° 57′. Hence, the shorter distance from a given body to a particular body is always identically the same, no matter if it has been derived from their clockwise or anti-clockwise distance : with this difference, that if a shorter distance has been obtained by the rectification of clockwise distance, then the same shorter distance will be obtained without the rectification of the corresponding anti-clockwise distance, and vice versa (see Schedule III).

Dictum II—When an arc exceeds a semi-circle or six houses, rectify it by deducting it from a full circle of twelve houses.

Again, when the clockwise or anti-clockwise distance exceeds xii houses, then cast off the full circle of xii houses and take only the remaining degrees and minutes as the shorter distance. In such a case the shorter distance is to be deemed to be an S.D. obtained with **no rectification.** Such a contingency arises when D.B. and S.P. are in the same house with the D.B. anti-clockwise [clock-wise]. For example, the clockwise distance from the Sun to Mercury is xii 16° 23′, so cast off the xii houses and take the remainder, 16° 23′, as the shorter distance obtained with no rectification. And the anti-clockwise distance from Neptune to Venus is xii 17° 42′, and casting off xii, the shorter distance with no rectification is 17° 42′. Therefore, we have

Rule IV—(a) When the Cl. D [Acl. D.] is not more than vi mundane houses, it is the shorter distance (S.D.) : (b) when it is greater than vi but less than xii houses, xi houses + one house-space of D.B. at birth minus Cl. D. [Acl. D] is the rectified shorter distance (S.D.) : and (c) when it exceeds xii houses, casting off xii houses, the balance is the shorter distance (S.D.) obtained with no rectification.

21. Increasing and Decreasing Series of Aspects of Direction—In primary mundane directions, when the clockwise [anti-clockwise] distance has not been rectified to obtain the shorter distance, the aspects continuously decrease, yielding a decreasing series of aspects, which may be termed **Case I.** And when the clockwise [anti-clockwise] distance has been rectified to obtain the shorter distance, they continuously increase, yielding an increasing series of aspects, which may be termed **Case II.** So, in Case I the aspect extent of the very first aspect of direction

will be just smaller than the clockwise [anti-clockwise] distance between D.B. and S.P., and the aspect extents of the subsequent aspects will go on decreasing till Conjunction and then they will begin to increase. And in Case II, the aspect extent of the very first aspect of direction will be just greater than the clockwise [anti-clockwise] distance between D.B. and S.P., and the aspect extents of the subsequent aspects will go on increasing till Opposition and then they will begin to decrease. For example, iv 12° 30′, the S.D. from Mars to Neptune, direct, has been obtained with no rectification of the Cl.D., so the first aspect extent is just **less** than the S.D., iv 12° 30′, and so it is iv 0° 0′ or trine, and the subsequent aspects **decrease**, e.g., square, sextile and so on to Conjunction, and then **increase**: again, iii 19° 2′, the S.D. from Mars to Jupiter, direct, has been obtained by the rectification of Cl. D., viii 1° 48′, so the first aspect extent is just **greater** than the S.D., iii 19° 2′, and it is iv 0° 0′ or trine, and the subsequent aspects **increase**, e.g., sesqui-square, quincunx, and Opposition, and then **decrease.** So, we have

Rule V—(a) When the shorter distance has been obtained without rectification, the extent of the first aspect of direction is just Less than the S.D., and the extents of the subsequent aspects Decrease till Conjunction and then Increase: and (b) when the S.D. has been obtained with rectification, then the extent of the first aspect of direction is just Greater than the S.D., and the extents of the subsequent aspects Increase till Opposition, and then Decrease.

22. The Scale of the Aspect Extents of Directions—The extents of aspects taken should always be those of D.B. They may be either on the scale of D.B.'s **diurnal** or **nocturnal** S.A., according as the D.B. was **above** or **below** its horizon at birth. For example, in the direct directions of Jupiter which is above its horizon at birth, its S.D.A. is taken to start with and is changed for its S.N.A. when it sets in the west; again, in the direct directions of Mars which is below its horizon at birth, its S.N.A. is taken to start with and is changed for its S.D.A. when when it rises in the east. Therefore, we have

Rule VI—(a) The Aspect Extents are always to be taken on the scale of the Diurnal houses of D.B. so long as D.B. is Above its horizon: and (b) on the scale of the Nocturnal houses of D.B. so long as D.B. is Below its horizon.

But the aspect extents of the D.B. are always to be measured from the S.P. towards the D.B. along the S.D. For example, in the direct directions of Mars to Neptune, the extent of trine, the first aspect of direction and those of the subsequent aspects are all measured from Neptune towards Mars along the unrectified S.D., iv 12° 30′. Again, in the direct directions of Mars to Jupiter the extent of trine, the first aspect of direction, and those of the subsequent aspects are all measured from Jupiter towards Mars along the rectified S.D., iii 19° 2′. Therefore, we have

Rule VII—Aspect Extents are always to be measured from the S.P. towards the D.B. along the S.D. between them.

23. Arcs of Directions—The **Arc of Direction** (A.D.) is the arc through which D.B. is moved during a direction. In Case I the first arc of direction is equal to the shorter distance minus the first aspect extent : and in Case II it is equal to the first aspect extent minus the shorter distance. For example, in the direct directions of Mars to Neptune, the unrectified shorter distance being iv 12° 30′ and the first aspect extent, trine or iv 0° 0′, the first arc of direction is iv 12° 30′—iv 0° 0′, i.e., 12° 30′. Again, in those of Mars to Jupiter, the rectified shorter distance being iii 19° 2′, the first aspect extent, trine or iv 0° 0′, and one nocturnal house space of Mars being 20° 50′, the first arc of direction is iii 20° 50′ – iii 19° 2′, that is, 1° 48′. Therefore, we have

Rule VIII—In Case I, the First A.D. = S.D.—the First A.E. : and in Case II, the First A.D. = the First A. E.—S.D.

When an aspect extent is an integral number of houses, deduct one from the number of houses, and add instead of it the degrees and minutes of one house-space of D.B. In both Cases I and II the A.D. of a subsequent direction always exceeds the previous A.D. by the difference between the previous aspect extent and the subsequent aspect extent. For example, the subsequent A.D.'s in the direct directions of Mars to Jupiter are :—

Mars sesqui-square Jupiter, 1° 48′ + (iv 10° 24′ – iv 0° 0′) = 1° 48′ + 10° 24′ = 12° 12′.
Mars bi-quintile Jupiter, 12° 12′ + (iv 16° 39′ – iv 10° 24′) = 12° 12′ + 6° 15′ = 18° 27′.
Mars quincunx Jupiter. 18° 27′ + (v 0° 0′ – iv 16° 39′) = 18° 27′ + 4° 10′ = 22° 37′.
Mars opposition Jupiter, 22° 37′ + (vi 0° 0′ – v 0° 0′) = 22° 37′ + 20° 50′ = 43° 27′.
Mars quincunx Jupiter, 43° 27′ + (vi 0° 0′ – v 0° 0′) = 43° 27′ + 20° 50′ = 64° 17′.
Mars bi-quintile Jupiter, 64° 17′ + (v 0° 0′ – iv 16° 39′) = 64° 17′ + 4° 10′ = 68° 27′.
Mars sesqui-square Jupiter, 68° 27′ + (iv 16° 39′ – iv 10° 24′) = 68° 27′ + 6° 15′ = 74° 42′.
Mars trine Jupiter, 74° 42′ + (iv 10° 24′ – iv 0° 0′) = 74° 42′ + 10° 24′ = 85° 6′.

Therefore, we have

Rule IX—(a) In Case I, Subsequent A. D. = the Previous A. D. + (the Previous A.E.—the Subsequent A.E.) : and

(b) in Case II, Subsequent A. D. = the Previous A. D. + (the Subsequent A.E.—Previous A.E.).

24. The Moderation of A.D. on D.B. Crossing its Horizon—Bodies below their horizon moved by the apparent diurnal rotation of the heavens, rise above their eastern [western] horizon (see Articles 18 and 22) during the very first or a subsequent direction, when the A.D. exceeds its eastern [western] horizontal distance. And bodies above their horizon set below their western [eastern] horizon during the very first or a subsequent direction when the A.D. exceeds its western

[eastern] horizontal distance. This is said to be the **crossing of its horizon** by a D.B. Therefore, the appropriate horizontal distance for bodies above their horizon is the western [eastern] horizontal distance, and for bodies below their horizon is the eastern [western] horizontal distance. For example, in direct directions, the appropriate horizontal distance (H.D.), for Saturn and Jupiter which are both above their horizon in George V's nativity, is the western horizontal distance (W.H.D.), and the appropriate H.D. for the other bodies which are all below their horizon is the eastern horizontal distance (E.H.D.) Therefore, we have

Rule X—The appropriate H.D. (i) of a body above its horizon is its W.H.D. [E.H.D.], and (ii) of a body below its horizon is its E.H.D. [W.H.D.]

To obtain the E.H.D. of a body, its C.D.F [C.D.B.] is to be added to the total space of all the houses running clockwise [anti-clockwise] between its house and the eastern horizon. And to obtain the W.H.D. of a body, its C.D.B. [C.D.F.] is to be added to the total space of all the houses running clockwise [anti-clockwise] between its house and the western horizon. For example, the E.H.D. of Mars, direct, which is below its horizon, is 16° 38′ + 4 × 20° 49′′7, i.e., 99° 57′. Again, the W.H.D. of Jupiter, direct, which is above its horizon, is 13° 46′ + 2 × 19° 21′′3, i.e., 52° 29′. Therefore, we have

Rule XI—(i) The E.H.D. of a body = its C.D.F. [C.D.B.] + the space of all houses running clockwise [anti-clockwise] from the cusp of its [of its next anti-clockwise] house to eastern horizon: and (ii) the W.H.D. of a body = its C.D.F. [C.D.B.] + the space of all the houses running clockwise [anti-clockwise] from the cusp of its [of its next anti-clockwise] house to western horizon. It will be evident that the spaces of all the houses will be on one and the same scale, diurnal or nocturnal, so long as A.D. does not exceed its appropriate H.D. But when A.D. exceeds the appropriate H.D. of D.B., D.B. will cross its horizon and the scale will change from one to the other—in the case of bodies above their horizon, the change is from their S.D.A. to S.N.A., and in those below their horizon, the change is from their S.N.A. to S.D.A. In such circumstances, the excess of A.D. over H.D. should be moderated to the new S.A. of D.B. The new S.A. of D.B. will be diurnal when D.B. rises in the east [west], and nocturnal when D.B. sets in the west [east]. The moderation of the excess of A.D. over the appropriate H.D. is carried on as follows :—

Previous S.A. of D.B. : Subsequent S.A. of D.B. : : Excess : Moderated Excess. For example, to obtain the A.D. on Neptune crossing its horizon to form the direct square to Jupiter, Neptune being below and the direction direct, the appropriate H.D. is E.H.D. which is 5° 44′, the unrectified S.D. is iii 14° 4′, and the first aspect extent is just less than iii 14° 4′ which is square or iii 0° 0′. Therefore, the first A.D. is equal to iii 14° 4′—iii 0° 0′, i.e., 14° 4′ ; and 14° 4′ is

greater than D.B.'s E.H.D. 5° 44′. So the excess of A.D. over H.D. is 8° 20′, which has to be moderated to the S.D.A. of Neptune, as it will be above its horizon after crossing. It is carried on as :—

·86° 41′ : 93° 19′ : : 8° 20′ : moderated excess.

(A.C.) 9·96797 (Sch. vi) + 1·33437 = 1·30234, T.P.L. of 8° 58′, the mod. excess. Again, in the direct direction, Saturn trine to the Sun, the A.D. obtained is 0° 27′ + 13′ 34′, i.e., 14° 1′ which exceeds 13° 46′, the W.H.D. of Saturn, by 0° 15′, which excess has to be moderated to 98° 38′, the S.N.A. of Saturn whose S.D.A. is 81° 22′, since Saturn is setting below its western horizon during the direction, as follows :—

81° 22′ : 98° 38′ : : 0° 15′ : moderated excess,

(A.C.) 9·91642 (Sch. vi) + 2·85354 = 2·76996, T.P.L. of 0° 18′, the mod. excess. Therefore, we have

Rule XII—The moderation of the excess of A.D. over H.D. is carried on:— Previous S.A. of D.B. : Subsequent S.A. of D.B. : : Excess : Moderated Excess.

In such directions, the A.D. is equal to the sum of H.D. and the moderated excess. It should be borne in mind, that the previous A.D. is not used in the calculations when a body crosses its horizon. For example, the A.D. of Neptune direct square to Jupiter is its E.H.D. 5° 44′ + its moderated excess, 8° 58′, which is equal to 14° 42′; and the A.D. of Saturn direct trine to the Sun is, its W.H.D. 13° 46′ + its moderated excess, 0° 18′, which is equal to 14° 4′. Therefore, we have

Rule XIII—The A.D. when D.B. crosses its horizon = H.D. + moderated excess.

The subsequent A.D.'s are found as usual, only the scale of the aspect extents has to be changed from one to the other.

25. Directions to the Angles—The above thirteen rules apply to the directions of bodies to the radical positions of Bodies. The rules have to be simplified to suit the cases of directions of bodies to the positions of the Angles, the (upper) Meridian and the (eastern) Horizon. (i) The S.P.'s, which are angles, have no C.D. to be moderated, so Rule I does not apply. (ii) For the same reason, the Cl. D. in direct directions to an Angle is equal to C.D.F. of D.B. + the number of clockwise houses between D.B.'s house and the Angle, and the Acl. D. in converse directions, is equal to the C.D.B. of D.B. + the number of anti-clockwise houses between D.B.'s house and the Angle, and so Rule II has to be modified as follows :—

The Cl. D. is equal to the C.D.F. of D.B. + the number of clockwise houses from the cusp of the D.B.'s house and the Angle : and the Acl. D. is equal to the C.D.B. + the number of anti-clockwise houses from the cusp of the D.B.'s next anti-clockwise house and the Angle.

(iii) Rule III will not apply, since in the clockwise and the anti-clockwise distance the odd right ascensional degrees and minutes are precisely the D.B.'s C.D.F. and C.D.B., and so will not exceed one house-space of D.B. (iv) Rules XII and XIII also will not apply, for D.B. will arrive at the horizon itself with no excess, and so A.D. and H.D. will always come to coincide sooner or later, forming conjunction or opposition to either Angle and square to the other Angle. So, while there is crossing and change in the scale of S.A.'s there will be no excess of A.D. over H.D. to be moderated. Therefore, in directions to either Angle only Rules IV to XI and the above modification of Rule II apply, and not the rest.

26. Determination of the A.D.'s in a Series of Primary Mundane Directions—Now we are in a position to find the A.D.'s of a series of primary mundane directions and of any particular primary mundane direction. It would facilitate calculations, if we preliminarily prepare the following five schedules :— (1) The C.D.B.'s and C.D.F.'s of every S.P. moderated to the birth S.A. of each D.B., (Schedule II). (2) The S.D.'s, rectified or unrectified, from every D.B. to each S.P., derived from the clockwise and the anti-clockwise distance between them, (Schedule III). (3) The A.E.'s of every aspect of each D.B., both on the diurnal and the nocturnal scale, (Schedule IV). (4) The appropriate E.H.D. or W.H.D. of every D.B., (Schedule V). (5) The Ternary Proportional Logarithm of the ratio of the birth S.A. to the other S.A. of every D.B., (Schedule VI). It should be noted well that in utilising the Schedule of Aspect Extents, firstly, that the series of the aspects of directions change from the decreasing one to the increasing one on reaching Conjunction, and from the increasing one to the decreasing one on reaching Opposition ; and secondly, that the scale of the aspect extents changes from the nocturnal to the diurnal on the D.B. rising above its horizon in the east [west], and from the diurnal to the nocturnal on D.B. setting below its horizon in the west [east.] The five Schedules, II to VI, have the inestimable advantage of enabling the calculator to steer clear of slips and errors, otherwise inevitable, for there is a rhythm about the succession and the flow of the figures in each schedule, when they are taken in particular orders, which the calculator on a slight reflection, will be able to readily realise and so to correct for himself easily all errors and slips that may creep into the schedules prepared.

We shall first calculate direct directions of bodies taken in their order at birth to (a) the two Angles, (b) the radical positions of Bodies, and next take up the converse directions of bodies in their order to (c) the two Angles, and (d) the radical positions of Bodies. In these calculations, as persons do not generally live beyond 90 years, we shall determine all A.D.'s whose measures do not exceed 90 degrees ; but as a matter of fact, aspects for 75 years and A.D.'s of 75 degrees will do amply.

Schedule II—Birth C.D.B.'s and C.D.F.'s of S.P.'s Moderated.

D.B.	C.D.	S. P. ♆	♀	☿	☉	♃	♂	☽	♄	♅
♆	B	23 10	5 28	24 16	0 16	3 37	5 48	3 55	14 13	8 20
	F	5 44	23 26	4 38	28 38	25 17	23 6	24 59	14 41	20 34
♀	B	19 28	4 36	20 24	0 14	3 2	4 53	3 17	11 57	7 0
	F	4 49	19 41	3 53	24 3	21 15	19 24	21 0	12 20	17 17
☿	B	19 8	4 31	20 3	0 13	2 59	4 48	3 14	11 45	6 53
	F	4 44	19 21	3 49	23 39	20 53	19 4	20 38	12 7	16 59
☉	B	15 49	3 44	16 34	0 11	2 28	3 58	2 40	9 42	5 41
	F	3 54	15 59	3 9	19 32	17 15	15 45	17 3	10 1	14 2
♃	B	15 11	3 35	15 54	0 11	2 22	3 48	2 34	9 19	5 28
	F	3 45	15 21	3 2	18 45	16 34	15 8	16 22	9 37	13 28
♂	B	16 42	3 57	17 30	0 12	2 36	4 12	2 49	10 15	6 0
	F	4 8	16 53	3 20	20 38	18 14	16 38	18 1	10 35	14 50
☽	B	24 57	5 54	26 8	0 17	3 53	6 15	4 13	15 19	8 58
	F	6 10	25 13	4 59	30 50	27 14	24 52	26 54	15 48	22 9
♄	B	21 45	5 8	22 47	0 15	3 23	5 27	3 41	13 21	7 49
	F	5 22	21 59	4 20	26 52	23 44	21 40	23 26	13 46	19 18
♅	B	15 31	3 40	16 16	0 11	2 25	3 53	2 37	9 32	5 35
	F	3 50	15 41	3 5	19 10	16 56	15 28	16 44	9 49	13 46

Schedule III—Unrectified or Rectified Shorter Distances between Bodies.

D.B.	S.D.	S. P. M.C.	A.S.C.	♆	♀	☿	☉	♃	♂	☽	♄	♅
♆	Cl.	iii 5 44	0 5 44	0 0 0	0r 17 42	0r 27 48	ir 22 54	iir 19 33	ivr 17 22	vr 19 15	v 19 57	iii 14 4
	Acl.	iiir 5 44	0r 5 44	0r 0 0	0 17 42	0 27 48	i 22 54	ii 19 33	iv 17 22	v 19 15	vr 19 57	iiir 14 4
♀	Cl.	iii 19 41	0 19 41	0 14 52	0 0 0	0r 8 29	ir 4 22	iir 1 34	iiir 24 0	vr 1 19	vr 16 56	iv 2 24
	Acl.	iiir 19 41	0r 19 41	0r 14 52	0r 0 0	0 8 29	i 4 22	ii 1 34	iii 24 0	v 1 19	v 16 56	ivr 2 24
☿	Cl.	iv 3 49	i 3 49	0 22 57	0 8 20	0 0 0	0r 19 50	ir 17 4	iiir 15 15	ivr 16 49	vr 8 18	iv 10 42
	Acl.	ivr 3 49	ir 3 49	0r 22 57	0r 8 20	0r 0 0	19 50	i 17 4	iii 15 15	iv 16 49	v 8 18	ivr 10 42
☉	Cl.	iv 19 32	i 19 32	i 15 38	i 3 33	0 16 23	0 0 0	0r 17 26	iir 15 56	iiir 17 14	ivr 10 12	v 5 30
	Acl.	ivr 19 32	ir 19 32	ir 15 38	ir 3 33	0r 16 23	0r 0 0	17 26	ii 15 56	iii 17 14	iv 10 12	vr 5 30
♃	Cl.	v 16 34	ii 16 34	ii 12 49	ii 1 13	i 13 32	0 16 45	0 0 0	ir 17 30	iir 18 44	iiir 11 59	vr 15 50
	Acl.	vr 16 34	iir 16 34	iir 12 49	iir 1 13	ir 13 32	0r 16 45	0r 0 0	i 17 30	ii 18 44	iii 11 59	v 15 50
♂	Cl.	ivr 4 11	iv 16 38	iv 12 30	iii 20 35	iii 13 18	ii 16 50	i 19 14	0 0 0	ir 1 23	ir 14 47	iiir 19 2
	Acl.	iv 4 11	ivr 16 38	ivr 12 30	iiir 20 35	iiir 13 18	iir 16 50	ir 19 14	0r 0 0	i 1 23	i 14 47	iii 19 2
☽	Cl.	iiir 4 13	v 26 54	v 20 44	v 1 41	iv 21 55	iii 27 11	ii 30 47	i 2 2	0 0 0	0r 20 1	iir 26 22
	Acl.	iii 4 13	vr 26 54	vr 20 44	vr 1 41	ivr 21 55	iiir 27 11	iir 30 47	ir 2 2	0r 0 0	0 20 1	ii 26 22
♄	Cl.	iir 13 21	vr 13 21	vr 18 43	v 18 54	v 9 26	iv 14 1	iii 17 9	i 19 13	0 17 27	0 0 0	iir 5 32
	Acl.	ii 13 21	v 13 21	v 18 43	vr 18 54	vr 9 26	ivr 14 1	iiir 17 9	ir 19 13	0r 17 27	0r 0 0	ii 5 32
♅	Cl.	0r 5 35	iiir 5 35	iiir 9 25	ivr 1 55	ivr 8 40	vr 5 24	v 16 11	iii 17 39	ii 16 23	ii 3 57	0 0 0
	Acl.	0 5 35	iii 5 35	iii 9 25	iv 1 55	iv 8 40	v 5 24	vr 16 11	iiir 17 39	iir 16 23	iir 3 57	0r 0 0

Schedule IV —Aspect Extents of Directed Bodies.

Noct. A.E's. of Neptune	Diff.;	Aspect	Diur. A. E.'s of Neptune	Diff.:
0 0° 0′	28° 53′·7	☌	0 0° 0′	31° 6′·3
i 0 0	14 27	☍	i 0 0	15 33
i 14 27	14 26	∠	i 15 33	15 34
ii 0 0	11 34	✶	ii 0 0	12 26
ii 11 34	17 20	☌	ii 12 26	18 40
iii 0 0	28 54	□	iii 0 0	31 6
iv 0 0	14 27	△	iv 0 0	15 33
iv 14 27	8 40	☍	iv 15 33	9 20
iv 23 7	5 46	±	iv 24 53	6 14
v 0 0	28 54	∓	v 0 0	31 6
vi 0 0		☌	vi 0 0	

Nocturnal A.E.'s of Venus	Diff.	Aspect	Diurnal A.E.'s of Venus	Diff.
0 0° 0′	24° 16′·7	☌	0 0° 0′	35° 43′·3
i 0 0	12 9	☍	i 0 0	17 51
i 12 9	12 8	∠	i 17 51	17 52
ii 0 0	9 43	✶	ii 0 0	14 17
ii 9 43	14 34	☌	ii 14 17	21 26
iii 0 0	24 17	□	iii 0 0	35 43
iv 0 0	12 8	△	iv 0 0	17 52
iv 12 8	7 17	☍	iv 17 52	10 43
iv 19 25	4 51	±	iv 28 35	7 9
v 0 0	24 17	∓	v 0 0	35 43
vi 0 0		☌	vi 0 0	

Noct. A.E.'s of Mercury	Diff.	Aspect	Diur. A.E.'s of Mercury	Diff
0 0° 0′	23° 52′·0	☌	0 0° 0′	35° 8′·0
i 0 0	11 56	☍	i 0 0	18 4
i 11 56	11 56	∠	i 18 4	18 4
ii 0 0	9 33	✶	ii 0 0	14 27
ii 9 33	14 19	☌	ii 14 27	21 41
iii 0 0	23 52	□	iii 0 0	36 8
iv 0 0	11 56	△	iv 0 0	18 4
iv 11 56	7 10	☍	iv 18 4	10 50
iv 19 6	4 46	±	iv 28 54	7 14
v 0 0	23 52	∓	v 0 0	36 8
vi 0 0		☌	vi 0 0	

Schedule IV —Aspect Extents of Directed Bodies—(Continued)

Nocturnal A.E's. of Snn	Diff.	Aspect	Diurnal A.E's. of Sun	Diff.
0 0° 0′		☌	0 0° 0′	
i 0 0	19° 43′0	☍	i 0 0	40° 17′0
i 9 51	9 51	∠	i 20 9	20 9
ii 0 0	9 52	✶	ii 0 0	20 8
ii 7 53	7 53	☌	ii 16 7	16 7
iii 0 0	11 50	□	iii 0 0	24 10
iv 0 0	19 43	△	iv 0 0	40 17
iv 9 51	9 51	☍	iv 20 9	20 9
iv 15 46	5 55	☌	iv 32 14	12 5
v 0 0	3 57	☍	v 0 0	8 3
vi 0 0	19 43	☌	vi 0 0	40 17

Noct. A.E.'s of Uranus	Diff.	Aspect	Diurnal A.E's. of Uranus	Diff.
0 0° 0′		☌	0 0° 0′	
i 0 0	18° 56′	☍	i 0 0	41° 4′
i 9 28	9 28	∠	i 20 32	20 32
ii 0 0	9 28	✶	ii 0 0	20 32
ii 7 34	7 34	☌	ii 16 26	16 26
iii 0 0	11 22	△	iii 0 0	24 38
iv 0 0	18 56	☍	iv 0 0	41 4
iv 9 28	9 28	☌	iv 20 32	20 32
iv 15 9	5 41	☍	iv 32 51	12 19
v 0 0	3 47	☌	v 0 0	8 13
vi 0 0	18 56	☍	vi 0 0	41 4

Nocturnal A.E's. of Mars	Diff.	Aspect	Diurnal A.E's. of Mars	Diff.
0 0° 0′		☌	0 0° 0′	
i 0 0	20° 50′	☍	i 0 0	39° 10′
i 10 24	10 24	∠	i 19 36	19 36
ii 0 0	10 25	✶	ii 0 0	19 35
ii 8 20	8 20	☌	ii 15 40	15 40
iii 0 0	12 30	□	iii 0 0	23 30
iv 0 0	20 50	△	iv 0 0	39 10
iv 10 24	10 24	☍	iv 19 36	19 36
iv 16 39	6 15	☌	iv 31 21	11 45
v 0 0	4 10	☍	v 0 0	7 50
vi 0 0	20 50	☌	vi 0 0	39 10

Schedule IV—Aspect Extents of Directed Bodies—(Continued)

Noct. A.E.'s of Moon	Diff.	Aspect	Diurnal A.E.'s of Moon	Diff.
0 0° 0′		☌	0 0° 0′	
i 0 0	31° 7′	☍	i 0 0	28° 53′
i 15 33	15 33	∠	i 14 27	14 27
ii 0 0	15 33	✶	ii 0 0	14 27
ii 12 27	12 27	☌	ii 11 13	11 33
iii 0 0	18 40	□	iii 0 0	17 20
iv 0 0	31 7	△	iv 0 0	28 53
iv 15 33	15 33	☐	iv 14 27	14 27
iv 24 53	9 20	±	iv 23 7	8 40
v 0 0	6 13	∓	v 0 0	5 47
iv 0 0	31 7	☍	vi 0 0	28 53

Diurnal A.E.'s of Saturn	Diff.	Aspect	Noct. A.E.'s of Saturn	Diff.
0 0° 0′		☌	0 0° 0′	
i 0 0	27° 7′	☍	i 0 0	32° 53′
i 13 34	13 34	∠	i 15 26	16 26
ii 0 0	13 34	✶	ii 0 0	16 26
ii 10 51	10 51	☌	ii 13 9	13 9
iii 0 0	16 16	□	iii 0 0	19 44
iv 0 0	27 7	△	iv 0 0	32 53
iv 13 34	13 34	☐	iv 16 26	16 26
iv 21 42	8 8	±	iv 26 18	9 52
v 0 0	5 26	∓	v 0 0	6 34
vi 0 0	27 7	☍	vi 0 0	32 53

Diurnal A.E.'s of Jupiter	Diff.	Aspect	Noct. A.E.'s of Jupiter	Diff.
0 0° 0′		☌	0 0° 0′	
i 0 0	19° 21′	☍	i 0 0	40° 39′
i 9 41	9 41	∠	i 20 19	20 19
ii 0 0	9 41	✶	ii 0 0	20 19
ii 7 45	7 45	☌	ii 16 15	16 15
iii 0 0	11 36	□	iii 0 0	24 24
iv 0 0	19 21	△	iv 0 0	40 39
iv 9 45	9 41	☐	iv 20 19	20 19
iv 15 30	3 49	±	iv 32 30	12 11
v 0 0	3 52	∓	v 0 0	8 8
vi 0 0	19 21	☍	vi 0 0	40 39

Schedule V—The appropriate E. H. D. or W. H. D. of bodies in both direct and converse directions.

Body	Rises or sets.	In Direct Direction.		In Converse Direction.	
♆	Rises.	5° 44′	E. H. D.	167° 38′	W. H. D.
♀	,,	19 41	E. H. D.	125 59	W. H. D.
☿	,,	27 41	E. H. D.	115 31	W. H. D.
☉	,,	39 15	E. H. D.	79 3	W. H. D.
♅	,,	54 26	E. H. D.	59 10	W. H. D.
♂	,,	99 57	E. H. D.	25 1	W. H. D.
☾	,,	182 27	E. H. D.	4 13	W. H. D.
♄	Sets.	13 46	W. H. D.	148 58	E. H. D.
♃	,,	52 29	W. H. D.	63 39	E. H. D.

SCHEDULE VI.—T. P. L's. for the moderation of the excess of A. D.

D.B's. in order.	Constant T. P. L. of S. A. of D. B. at Birth : S. A. of D. B. after Crossing.	D. B. Rises or Sets.
♆	86° 41′ : 93° 19′ 9·96797	Rises.
♀	72 50 : 107 10 9·83227	,,
☿	71 36 : 108 24 9·81988	,,
☉	59 9 : 120 51 9·68971	,,
♅	56 48 : 123 12 9·66374	,,
♂	62 29 : 117 31 9·72566	,,
☽	93 20 : 86 40 0·03218	,,
♄	81 22 : 98 38 9·91642	Sets.
♃	58 4 : 121 56 9·67780	,,

The following eight problems illustrate all the principles and methods enunciated in Articles 18 to 26.

Problem 1—Find the A.D's. less than 90° of all the direct mundane directions of Venus to M. C.

♀ to M. C. E. H. D.=19° 41′.
Cl. D.= iii 19° 41′ ∴ S.D. Unrect=iii 19° 41′. ∴ A. E.'s Decrease from S.D. till ♂.
D. B. is Below ∴ A. E.'s are Nocturnal till D. B. Rises.
∴ 1st. A. E. is Nocturnal and just Less than S. D., i.e., iii 0° 0′=Square, □,

[1] ♀ □ M. C. A. D.=iii 19° 41′ − iii 0 0=19° 41′.
Now A. D. equals H. D. ∴ D.B. Rises, and A.E's. become Diurnal.

[2] ♀ ⚹ M. C. A. D.=19° 41′+21° 26′=41° 7′.
[3] ♀ ✶ M. C. A. D.=41 7 +14 17 =55 24.
[4] ♀ ∠ M. C. A. D.=55 24 +17 52 =73 16.

Problem 2—Find the A. D's less than 90° of all the direct mundane directions of Mars to M. C.

♂ to M.C. E.H.D.=99° 57′. Cl. D.=vii 16° 38′ ∴ S. D. Rect.=iv 4° 11′.
∴ A. E.'s. Increase from S. D. till ☽.
D. B. is Below. ∴ A. E.'s are Nocturnal till D. B. Rises.
∴ 1st. A.E. is Nocturnal and just Greater than S. D., i. e.,
iv 10° 24′=Sesqui-square, ⊡.

[1]	♂	⊡	M. C.	A. D.=iv 10° 24′	—	iv	4° 11′=	6° 13′
[2]	♂	☍	M. C.	,,	= 6 13+		6 15 =12	28.
[3]	♂	⚻	M. C.	,,	= 12 28+		4 10 =16	38.
[4]	♂	☌	M. C.	,,	= 16 38+		20 50 =37	28.
[5]	♂	⚻	M. C.	,,	= 37 28+		20 50 =58	18.
[6]	♂	☍	M. C.	,,	= 58 18+		4 10 =62	28.
[7]	♂	⊡	M. C.	,,	= 62 28+		6 15 =68	43.
[8]	♂	△	M. C.	,,	= 68 43+		10 24 =79	7.

Problem 3—Find the A. D.'s less than 90° of all the direct mundane directions of Mercury to Horizon.

☿ to Hor. E. H. D.=27° 41′. Cl. D.=i 3° 49′. ∴ S. D. Unrect. =i 3° 49′
∴ A. E's. Decrease from S. D. till ♂.
D. B. is Below. ∴ A. E's. are Nocturnal till D. B. Rises.
∴ 1st A.E. is Nocturnal and just Less than S.D., i.e., i 0° 0′= Semi- sextile, ⚺.

[1] ☿ ⚺ Hor. A. D.=i 3° 49′−i 0° 0′= 3° 49′.
[2] ☿ ☌ Hor. ,, 3 49+ 23 52 =27 41.
A. D. equals H. D. ∴ D. B. Rises ∴ A. E's. become Diurnal
[3] ☿ ⚺ Hor. A. D.=27° 41′+36° 8′=63° 49′.
[4] ☿ ∠ Hor. ,, =63 49 +18 4 =81 53.

Problem 4—Find the A. D's. less than 90° of all the direct mundane directions of Jupiter to Horizon.

♃ to Hor. W. H. D. 52° 29′. Cl. D.=viii 13° 46′. S. D. Rect.=iii 5° 35′.
∴ A. E.'s. Increase from S. D. till ☽.

D. B. is Above. ∴ A. E's. are Diurnal till D. B. sets.

∴ 1st. A. E. is Diurnal and just Greater than S. D., i.e., iv 0° 0′ = Trine, △.

[1] ♃ △ Hor.—A. D. = iv 0° 0′ or iii 19° 21′ − iii 5° 35′ = 13° 46′.

[2] ♃ □ Hor.—,, = 13 46 + 9 41 = 23 27.

[3] ♃ ☌ Hor.—,, = 23 27 + 5 49 = 29 16.

[4] ♃ ☍ Hor.—,, = 29 16 + 3 52 = 33 8.

[5] ♃ ☿ Hsr.—,, = 33 8 + 19 21 = 52 29.

Problem 5—Find the A. D's. less than 90° of all the direct mundane directions of Venus to Neptune.

♀ to Ψ E. H. D. = 19° 41′. Cl. D = xi 19° 41′ + 23° 10′ mod. to S. N. A. of D. B., ♀.

86° 41′ : 23° 10′ : : 72° 50′ : mod. C. D. B. of Ψ

0·57307 + 0·39294 = 0·96601, T. P. L. of 19° 28′.

Cl. D. = xi 39° 9′ = xii 14° 52′ ∴ S. D. Unrect. = 14° 52′.

∴ A. E's. Decrease from S. D. till ☌.

D. B. is Below. ∴ A. E's. are Nocturnal till D. B. Rises.

∴ 1st. A. E. is Noct. and just Less than S. D., i.e., 0° 0′ = Conjunction, ☌.

[1] ♀ ☌ Ψ A. D. = 14° 52′ − 0° 0′ = 14° 52′.

[2] ♀ ⚺ Ψ ,, = 14 52 + 24 17 = (39° 9′).

A. D. Exceeds H. D. by 19° 28′ ∴ D. B. Rises ∴ Moderate.

72° 50′ : 19° 28′ : : 107° 10′ : mod. Excess.

9·83227 + 0·96601 = 0·79828, T. P. L. of 28° 38′.

∴ A. D. = 19° 41′ + 28° 38′ = 48° 19′.

[3] ♀ ∠ Ψ ,, = 48 19 + 17 51 = 66 10.

[4] ♀ ✶ Ψ ,, = 66 10 + 17 52 = 84 2.

Problem 6—Find the A. D's less than 90° of all the direct mundane directions of Saturn to Neptune.

♄ to Ψ W. H. D. = 13° 46′. Cl. D. = v 13° 46′ + 23° 10′ mod. to S. D. A. of D.B., ♄.

86° 41′ : 23° 10′ : : 81° 22′ : mod. C. D. B. of Ψ

0·57307 + 0·34483 = 0·91790, T. P. L. of 21° 45′.

Cl. D. = v 35° − 31′ = vi 8° 24′. ∴ S. D. Rect. = v 18° 43′.

A. E's. Increase from S. D. till ☿.

D. B. is Above. ∴ A. E's. are Diurnal till D. B. sets.

∴ 1st A. E's. is Diurnal and just Greater than S.D., i.e., vi 0° 0′ = Opposition. ☿.

[1] ♄ ☿ Ψ A. D. vi 0° 0′ or v 27° 7′ − v 18° 43′ = 8° 24′.

[2] ♄ ☍ Ψ ,, 8 24 + 27 7 = (35° 31′).

A. D. Exceeds H. D. by 21° 45′ ∴ D. B. sets ∴ Moderate.

81° 22′ : 21° 45′ : : 98° 38′ : mod. Excess.

9·91642 + 0·91790 = 0·83432, T. P. L. of 26° 22′.

∴ A. D. 13° 46′ + 26° 22′ = 40° 8′

[3] ♄ ☌ Ψ ,, 40 8 + 6 34 = 46 42.

[4] ♄ □ Ψ ,, 46 42 + 9 52 = 56 34.

[5] ♄ △ Ψ ,, 56 34 + 16 26 = 73 0.

Problem 7—Find the A. D's. less than 90° of all the direct mundane directions of Jupiter to the Sun.

♃ to ☉ W. H. D. 52° 29′. Cl. D. = vi 13° 46′ + 0° 11′ mod. to S. D. A. of D. B., ♃.

59° 9′ : 0° 11′ : : 58° 4′ : mod. S. D. B. of ☉

2·50871 + 0·49135 = 3·00006, T. P. L. of 0° 11′.

Cl. D. vi 13° 57′. ∴ S. D. Rect. v 5° 24′.

∴ A. E's. Increase from S. D. till ♂.

D. B. is Above. ∴ A. E's. are Diurnal till D. B. sets.

∴ 1st A. E. is Diurnal and just Greater than S.D., i.e., vi 0° 0′ = Opposition, ♂

[1] ♃ ♂ ☉ A. D. = vi 0° 0′ or v 19° 21′ − v 5′ 24′ = 13° 57′.
[2] ♃ ☌ ☉ ,, 13 57 + 19 21 = 33 18.
[3] ♃ ☍ ☉ ,, 33 18 + 3 52 = 37 10.
[4] ♃ ☐ ☉ ,, 37 10 + 5 49 = 42 59.
[5] ♃ △ ☉ ,, 42 59 + 9 41 = (52 40).

Now A. D. Exceeds H. D. by 0° 11′ ∴ D. B. sets ∴ Moderate.

58° 4′ : 0° 11′ : : 121° 56′ : mod. Excess.

9·67780 + 3·00006 = 2·67786, T. P. L. of 0° 23′.

∴ A. D. = 52° 29′ + 0° 23′ = 52° 52′.

Problem 8—Find the A. D's. less than 90° of all the mundane directions of the Moon to Uranus.

☽ to ♅ E. H. D. 182° 27′. Cl. D. ii 26° 54′ + 2° 22′ mod. to S. N. A.. D. B., ☽.

56° 48′ : 2° 22′ : : 93° 20′ : mod. C. D. D. of ♅

1·38022 + 0·28524 = 1·66546, T. P. L. of 3° 53′.

Cl. D. = ii 30° 47′. S. D. Unrect. = ii 30° 47′.

∴ A. E's. Decrease from S. D. till ☌.

D. B. Below. ∴ A. E.'s. are Nocturnal till ☽ B. rises.

∴ 1st A. E. is Nocturnal and just Less than S. D., i.e., ii 12° 27′ = Quintile, Q.

[1] ☽ Q ♅ A.D. = ii 30° 47′ − ii 12° 27′ = 18° 20′.
[2] ☽ ✶ ♅ ,, 18 20 + 12 27 = 30 47
[3] ☽ ∠ ♅ ,, 30 47 + 15 33 = 46 20.
[4] ☽ ⚺ ♅ ,, 46 20 + 15 33 = 61 53.

Exercise 9 – Prepare the schedule of the birth C.D.B.'s and C.D.F.'s of every S.P. moderated to S.A. of each D.B. for the standard nativity.

Exercise 10 – Prepare the schedule of the Clockwise and the Anti-clockwise Shorter Distances from every D.B. to every S.P. for the standard nativity.

Exercise 11 – Prepare the schedule of all the Aspect Extents, both on the diurnal and the nocturnal scale, of every D.B. for the standard nativity.

Exercise 12 – Prepare the schedule of the appropriate E.H.D. and W.H.D. of every D.B. for the standard nativity.

Exercise 13 – Prepare the schedule of the T.P.L.'s of the ratios of the birth S.A. to the other S.A. of every D.B. for the standard nativity.

Exercise 14 – Calculate the A.D.'s of all the direct directions of every Body to M.C in the standard nativity.

Exercise 15 – Calculate the A.D.'s of all the direct directions of every Body to the Horizon in the standard nativity.

Exercise 16 – Calculate the A.D.'s of all the direct directions of Mars to every S.P in the standard nativity.

Exercise 17 – Calculate the A.D.'s of all the direct directions of Neptune to every S.P. in the standard nativity.

Exercise 18 – Calculate the A.D.'s of all the direct directions of Jupiter to every S.P. in the standard nativity.

Exercise 19 – Calculate the A.D.'s of all the direct directions of Uranus to every S.P. in the standard nativity.

Exercise 20 – Calculate the A.D.'s of all the direct directions of Venus to every S.P. in the standard nativity.

Exercise 21 – Calculate the A.D.'s of all the direct directions of the Sun to every S.P. in the standard nativity.

Exercise 22 – Calculate the A.D.'s of all the direct directions of Moon to every S.P. in the standard nativlty.

Exercise 23 – Calculate the A.D.'s of all the direct directions of Saturn to every S.P. in the standard nativity.

Exercise 24 – Calculate the A.D.'s of all the direct directions of Mercury to every S.P. in the standard nativity.

Exercise 25 – Calculate the A.D.'s of all the converse directions of every Body to M.C. in the standard nativity.

Exercise 26 – Calculate the A.D.'s of all the converse directions of every Body to the Horizon in the standard nativity.

Exercise 27 – Calculate the A.D.'s of all the converse directions of Mercury to every S.P. in the standard nativity.

Exercise 28 – Calculate the A.D.'s of all the converse directions of Saturn to every S.P. in the standard nativity.

Exercise 29 – Calculate the A.D.'s of all the converse directions of Moon to every S.P. in the standard nativity.

Exercise 30 – Calculate the A.D.'s of all the converse directions of the Sun to every S.P. in the standard nativity.

Exercise 31 – Calculate the A.D.'s of all the converse directions of Venus to every S.P. in the standard nativity.

Exercise 32 – Calculate the A.D.'s of all the converse directions of Uranus to every S.P. in the standard nativity.

Exercise 33 – Calculate the A.D.'s of all the converse directions of Jupiter to every S.P. in the standary nativity.

Exercise 34 – Calculate the A.D.'s of all the converse directions of Neptune to every S.P. in the standard nativity.

Exercise 35 – Calculate the A.D.'s of all the converse directions of Mars to every S.P. in the standard nativity.

27. Determination of the A. D. of a Body directed to a given Aspect— The first arc of direction after birth and then the subsequent arcs of direction may be determined in as rapid a succession as may be convenient, till the required aspect is reached, as described in Articles 19 to 25. But if one wants to calculate straight the arc of direction to any particular aspect, then he has to adopt the same rules with a few modifications. Firstly, find the clockwise [anti-clockwise] and the shorter distance as described in Articles 19 and 20. Secondly, take the A.E. on the scale of the S.A. of D.B. at birth (see Art. 22). The given aspect may be of the decreasing or increasing series, and the D.B. may be anti-clockwise or clockwise [clockwise or anti-clockwise] of the S.P. So, we have the following four cases :—

Case A,	D.B. Anti-clockwise [Clockwise],	and	aspect of	Decreasing series.
„ B,	„	„	„	Increasing series.
„ C,	„ Clockwise [Anti-clockwise].		„	Increasing series
„ D,	„	„	„	Decreasing series.

For example, in the series of direct directions of Mars to M.C. worked out in Problem 2, the aspects prior to opposition are of the increasing series and the very same aspects subsequent to opposition are of the decreasing series.

Thirdly, determine the A.D. with the aid of

Rule XIV—In Case A,		A.D. = S.D. − A.E.	[xii − (S.D. + A.E.)]
,,	B,	A,D. = S.D. + A.E.	[A.E. − S.D.]
,,	C,	A.D. = A.E. − S.D.	[S.D. + A.E.]
,,	D,	A.D. = xii − (S.D. + A.E.)	[S.D. − A.E.]

Next you should convert the A.D. obtained into its equivalent degrees and minutes by taking the integral number of houses in it on the scale of the S.A. of the D.B. at the commencement of the direction. Fourthly, find the appropriate H.D. of the D.B., that is, the E H.D. [W.H.D.] if it is below its horizon, and the W.H.D. [E.H.D,] if it is above its horizon (see Art. 24), Now, if the A.D. in degrees and minutes does not exceed the appropriate E.H.D. or W.H.D. of the D.B., then the A.D. obtained in degrees and minutes is the arc of direction. But if the A.D. exceeds the E.H.D. or W.H.D., then the excess of A.D. over E.H.D. or W.H.D. should be moderated to the semi-arc of the D.B. other than the one at the beginning of the direction. In such a case, the sum of the E.H.D. or W.H.D. and the moderated excess is the A.D. in degrees and minutes.

Problem 9—Find the A.D. in the Direct direction of the Sun to its Decreasing mundane Quintile of the Meridian.

☉ Q.M.C.—E.H.D. of ☉ is 39° 15′.
Clockwise Unrect. S.D. between ☉ and M.C. is iv 19° 32′.
D.B. is below its horizon at birth.
∴ Noct, A.E. of the Quintile of ☉ is ii 7° 53′.
D.B. is Anti-clockwise, and the Aspect is of Decreasing series.

Case A. A.D. = S.D.—A.E.
,, = iv 19° 32′ − ii 7° 35′. = ii 11° 39′.
∵ D.B. is below its hor. and its one noct. house is 19° 43′
∴ A.D., ii 11° 39′ = 2 × 19 °43′ + 11° 39′ = 51° 5′.
∵ A.D. exceeds H.D. by 51° 5′ − 39° 15′, i.e., 11° 50′ the excess 11° 50′ should be moderated to S.D.A. of ☉ :—
59° 9′; 120° 51′ : : 11° 50′: moderated excess.
9·68971 (Sch. VI) + 1.18217 = 0·81788, T.P.L. of 24° 11′.
∴ A.D. = 39° 15′ + 24° 11′ = 63° 26′.

Problem 10—Find the A. D. in the Direct direction of Uranus to its Increasing mundane Semi-square of Mercury.

♅ ∠ ☿ E.H.D. of ♅ is 54° 26′.
Clockwise Unrect. S.D. between ♅ and ☿ is i 13° 32′.
D.B. is below its horizon at birth.
∴ Noct. A.E. of the Semi-square of ♅ is i 9° 28′.

D.B. is Anti-clockwise, and the aspect is of Decreasing series.

Case B. A.D. = S.D. + A.E.

$\therefore$ = i 13° 32′ + i 9° 28′ = ii 23° 0′.

$\because$ D.B. is below its hor. and its one noct. house is 18° 56′.

$\therefore$ A.D., ii 23° 0′ = 2 x 18° 56′ + 23° 0′ = 60° 52′.

$\because$ A.D. exceeds H.D. by 60° 52′ − 54° 26′, i.e., 6° 26′, the excess, 6° 26′, should be moderated to S.D.A. of ☿ :—

56° 48′ : 123° 12′ : : 6° 26′ : moderated excess.

9·66374 + 1·44684 = 1°11058, T.P.L. of 13° 57′.

$\therefore$ A.D. = 54° 26′ + 13° 57′ = 68° 23′.

Problem 11—Find the D.B. in the Direct direction of Neptune to its Increasing mundane Quintile of Mercury.

♆ Q ☿ E.H.D. of ♆ is 5° 44′.

Clockwise Rect. S.D. between ♆ and ☿ is 0 27° 48′.

D.B. is below its horizon at birth.

$\therefore$ Noct. A.E. of the Quintile of ♆ is ii 11° 34′.

D.B. is Clockwise, and the Aspect is of Increasing series.

Case C. A.D. = A.E. − S.D.

,, = ii 11° 34′ − 0 27° 48′ = i 40° 28′ − 0 27° 48′, for ♆ is below its hor., and its one noct. house is 28° 54′.

$\therefore$ A.D. = i 12° 40′.

For the same reason, A.D. i 12° 40′ = 28° 54′ + 12° 40′ = 41° 34′.

$\because$ A.D. exceeds H.D. by 41° 34′ − 5° 44′, i.e., 35° 50′, the excess, 35° 50′, should be moderated to S.D.A. of ♆ :—

86° 41′ : 93° 19′ : : 35° 50′ : moderated excess.

9·96797 + 0·70099 = 0.66896, T.P.L. of 38° 35′.

$\therefore$ A.D. = 5° 44′ + 38° 35′ = 44° 19′.

Problem 12.—Find the D. B. in the Direct direction of the Sun to its Decreasing mundane Sesqui-square of Saturn.

☉ ☐ ♄—E-H.D. of ☉ is 39° 15′.

Clockwise Rect. S.D. between ☉ and ♄ is iv 10° 12′.

D.B. is below its horizon at birth.

$\therefore$ Noct. A.E. of the Sesqui-square of ☉ is iv 9° 51′.

D.B. is Clockwise, and the Aspect is of Decreasing series.

Case D. A.D. = xii − (S.D. + A.E.)

,, = xii − (iv 10° 12′ + iv 9° 51′) = xi 19° 43′—ix 0° 20′, for ☉ is below its hor. and its one noct. house is 19° 43′.

$\therefore$ A.D. = ii 19° 23′.

$\therefore$ For the same reason, A.D., ii 19° 23′ = 2 × 19° 43′ + 19° 23′ = 58° 49′.

$\therefore$ A.D. exceeds H.D. by 58° 49′—39° 15′, i.e., 19° 34′, the excess, 19° 34′ should be moderated to S.D.A. of ☉ :—

59° 9′ : 120° 51′ : : 19° 34′ : moderated excess.

9·68971 + 0·96376 = 0·65347, T.P.L. of 39° 59′.

$\therefore$ A.D. = 39° 15′ + 38° 59′ = 79° 14′.

Exercise 36—Find the A.D. in the Direct direction of Mars to the Decreasing mundane Conjunction of Saturn in the standard nativity.

Exercise 37—Find the A.D. in the Direct direction of Jupiter to the Increasing mundane Sextile of itself, in the standard nativity.

Exercise 38—Find the A.D. in the Direct direction of the Sun to the Decreasing mundane Square of Uranus in the standard nativity.

28. Determination of the Mundane Aspect of a given A.D.—The determination of an aspect given the arc, that is, the determination of the aspect whose influence will be felt at a particular age in an individual's life, is just the converse of the problem described in the previous article. As before, find the appropriate horizontal distance of the directed body, and the shorter distance rectified or unrectified, between the directed body and the stationary position. Now, if the A.D. is given in years and months convert them into degrees and minutes at the rate of one degree per year; and if it is given in ordinal number of years, e.g., the 58th year then take the mid-point, i.e., 57½ years and convert it into degrees and minutes. But if the A.D. is given in degrees and minutes take them as they are. After converting, if necessary, the given arc of direction, into degrees and minutes, we should see if it exceeds the appropriate horizontal distance of the D.B. If it does not exceed, take it as it is; and if it exceeds, inversely moderate the excess to the semi-arc of the directed body **at birth**, for the excess obtained is on the scale of its other semi-arc. Then take the sum of the horizontal distance and the inversely moderated excess as the given A.D. Next, convert the new A.D. found in degrees and minutes into its equivalent houses, degrees and minutes, taken on the scale of the S.A. of the directed body **at birth**. There are the same four cases as those stated in Article 27; and the A.E. on the birth scale is determined with the aid of

Rule XV—In Case A, A.E. = S.D. − A.D. [xii − (S.D. + A.D.)]
Case B, A.E. = A.D. − S.D. [A.D. + S.D.]
Case C, A.E. = A.D. + S.D. [A.D. − S.D.]
Case D, A.E. = xii − (S.D. + A.D.) [S.D. − A.D.]

Now that A.E. is known, the corresponding Aspect may be read from Schedule IV.

Problem 13.—Find the Decreasing Direct mundane aspect of the Sun to the Meridian, relating to the 64th year in George V's life.

Given 64th year is approximately equal to A.D. 63° 30′.

E.H.D. of ☉ is 39° 15′.

Clockwise Unrect. S.D. between ☉ and M.C. is iv 19° 32′.

∵ Given A.D., 63° 30′, exceeds H.D. by 24° 15′, the excess should be moderated inversely as follows:—

120° 51 : 59° 9′ :: 24° 15′ : moderated excess.

1·31029 + 0·87056 = 1·18085, T.P.L. of 11° 51′.

∴ A.D. becomes 39° 15′ + 11° 51′ = 51° 7, which should be taken as nocturnal, for the excess has been moderated to S.N.A. of ☉.

∴ A.D., 51° 7′ = 2 × 19° 43′ + 11° 41′, for one noct. house of ☉ is 19° 43′.

∴ A.D. = ii 11° 41′.

D.B. is Anti-clockwise. and the Aspect is of the Decreasing series.

Case A., A.E. = S.D. − A.D.

,, = iv 19° 32′ − ii 11° 41′ = ii 7° 51′ (Noct.)

,, = Quintile of ☉.

∴ The required Aspect is ☉ Q M.C.

Problem 14.—Find the Increasing Direct mundane aspect of Uranus to Mercury, relating to the 69th year in George V's life.

Given 69th year is approximately equal to A.D. 68° 30′.

E.H.D. of ♅ is 54° 26′.

Clockwise Unrect. S.D. between ♅ and ☿ is i 13° 32′.

∵ Given A.D. 68° 30′, exceeds H.D. by 14° 4′, the excess should be moderated inversely as follows :—

123° 12′ : 56° 48′ : : 14° 4′ : moderated excess.

0·33626 + 1·10708 = 1·44334, T.P.L. of 6° 29′.

∴ A.D. becomes 54° 26′ + 6° 29′ = 60° 55′, which should be taken as nocturnal, for the excess has been moderated to S.N.A. of ♅.

∴ A.D., 60° 55′ = 3 × 18° 56′ + 4° 7′ = iii 4° 7′, for one noct. house of ♅ is 18° 56′.

∴ A.D. = iii 4° 7′.

D.B. is Anti-clockwise, and the Aspect is of the Increasing series.

Case B., A.E. = A.D. — S.D.

,, = iii 4° 7′ − i 13° 32′ = i 9° 31′ (Noct.), for one house of ♅ in 18° 56′.

,, = Semi-square of ♅;

∴ The required Aspect is ♅ ∠ ☿.

Problem 15.—Find the Increasing Direct mundane aspect of Neptune to Mercury, relating to the 45th year in George V's life.

Given 45th year is approximately equal to A.D. 44° 30′.

E.H.D. of ♆ is 5° 44′.

Clockwise Rect. S. D. between ♆ and ☿ is 0 27° 48′.

∵ Given A.D. 44° 30′, exceeds H.D. by 38° 46′, the excess should be moderated inversely as follows :—

93° 19′ : 86° 41′ : : 38° 46′ : moderated excess.

0·03203 + 0·66681 = 0·69884 T.P.L. of 36° 1′.

∴ A.D. becomes 5° 44′ + 36° 1′ = 41° 45′, which should be taken as nocturnal, for the excess has been moderated to S.N.A. of ♆

∴ A.D., 41° 45′ = 1 × 28° 54′ + 12° 51′, for one noct. house of ♆ is 28° 54′,

∴ A.D. = i 12° 51′.

D.B. is Clockwise, and the Aspect is of the Increasing series.

Case C., A.E. = A.D. + S.D.

,, = i 12° 51′ + 0 27° 48′ = ii 11° 45′ (Noct.), for one house of ♆ is 28° 54′

,, = Quintile of ♆.

∴ The required aspect is ♆ Q ☿

Problem 16.—Find the Decreasing Direct mundane aspect of the Sun to Saturn, relating to the 80th year in George V's life.

Given 80th year is approximately equal to A.D. 79° 30′.

E.H.D. of ☉ is 39° 15′.

Clockwise Rect. S.D. between ☉ and ♄ is iv 10° 12′.

∵ Given A.D. 79° 30′ exceeds H.D. by 40° 15′, the excess should be moderated inversely as follows :—

120° 51′ : 59° 9′ : : 40° 15′ : moderated excess.

9·31029 + 0·65051 = 0·96080, T.P.L of 19° 42′.

∴ A.D. becomes 39° 15′ + 19° 42′ = 58° 57′ which should be taken as nocturnal, for the excess has been moderated to S.N.A. of ☉.

∴ A.D., 58° 57′ = 2 x 19° 43′ + 19° 31′, for one noct. house of ☉ is 19° 43′.

∴ A.D. = ii 19° 31′.

D.B. is Clockwise and the Aspect is of the Decreasing series.

Case D., A.E. = xii − (S.D. + A.D.)
„ = xii − (iv 10° 12′ + ii 19° 31′) = xi 19° 43′ − vii 10° 0′.
„ = iv 9° 43′ (Noct.), for one house of ☉ is 19° 43′.
„ = Semi-square of ☉.
∴ The required aspect is ☉ ∠ ♄.

To calculate the A.D.'s in isolated cases, it will do to prepare instead of Schedule II, a schedule of the ternary proportional logarithms of the ratios of the birth S.A.'s of S.P.'s to their C.D.B.'s to be used in direct directions, and of their C.D.F.'s to be used in converse directions, and to note also the T.P.L. of the S. A.'s of D.B.'s at birth.

SCHEDULE—VII.

T.P.L.'s of the Ratio, S.A. of S.P. : C.D.B. or C.D.F. of S.P.

S.P.'s in their order.	T.P.L. of S.A. of S.P. at birth : C.D.B. of S.P.	T.P.L. of S.A. of S.P. at birth : C.D.F. of S.P.	T.P.L. of S.A. of D.B. at birth.
♆	86° 41′ : 23° 10′ 0·57307	86° 41′ : 5° 44′ 1·17953	86° 41′ 0·31734
♀	72° 50′ : 4° 36′ 1·19957	72° 50′ : 19° 41′ 0·56823	72° 50′ 0·39294
☿	71° 36′ : 20° 3′ 0·55280	71° 36′ : 3° 49 1·27323	71° 36′ 0·40036
☉	59° 9′ : 0° 11′ 2·50871	52° 9′ : 19° 32′ 0·48118	59° 9′ 0·48332
♅	56° 48′ : 2° 22′ 1·38022	56° 48′ : 16° 34′ 0·53512	56° 48′ 0·50092
♂	62° 29′ : 4° 11′ 1·17424	62° 29′ : 16° 38′ 0·57478	62° 29′ 0·45951
☽	93° 20′ : 4° 13′ 1·34506	93° 20′ : 26° 54′ 0·54028	93° 20′ 0·28524
♄	81° 22′ : 13° 21′ 0·78496	81° 22′ : 13° 46′ 0·77161	81° 22′ 0·34483
♃	58° 4′ : 5° 35′ 1·01703	58° 4′ : 13° 46′ 0·62509	58° 4′ 0·49135

Exercise 39—What is the Increasing Direct mundane aspect of Venus to Sun, that operates in the 68th year in the standard nativity.

Exercise 40—What is the Decreasing Direct mundane aspect of Saturn to Jupiter, that operates in the 37th year in the standard nativity.

Exercise 41—What is the Increasing Direct mundane aspect of Neptune to Uranus, that operates in the 72nd year in the standard nativity.

29. Relation between primary mundane directions to the Meridian and those to the Horizon.—It will be seen that the A.D.'s of a D.B. to mundane aspects of the Meridian and to those of the Horizon are identically the same, and the corresponding aspects though different in name bear a definite relation to one another. The relations may be ascertained from the schedule below.

Schedule VIII—The Relation between the Directions to the two Angles.

To one		To the other	To one		To the other	To one		To the other
☌	...	□	✶	...	☍ or ☌	☐	...	∠ or ☐
☌	...	△ or ✶	□	...	☍ or ☌	☌	...	✶ or △
∠	...	☐ or ∠	△	...	☌ or ☍	☍	...	□

So if the A.D. of an aspect, other than the quintile and the biquintile, of a body to one of the Angles is known, we can readily state the aspect of the body to the other angle, having the same A.D. with the aid of

Rule XVI.—When the mundane aspect of a body to an Angle is given, to obtain the mundane aspects of the body to the other Angle, to the given mundane aspect of a body to an Angle add three houses, and if necessary, cast off 6 houses from the sum: and also deduct the given mundane aspect from 9 houses, and if necessary, cast off 6 houses from the remainder. The reader may verify the rule by comparing the A.D.'s in the following directions to the two Angles:—

Dir. to Merid. or	Dir. to Hor.	Arc.	Dir. to Merid. or	Dir. to Hor.	Arc.
♆ □ M. C.	♆ ☌ Hor.	=5° 44′	☽ ☍ M. C.	☽ □ Hor.	=89° 7′
♆ ✶ M. C.	♆ ☌ Hor.	=36 50	♄ □ M. C.	♄ ☍ Hor.	=13 46
♆ ☌ M. C.	♆ ✶ Hor.	=67 57	♄ △ M. C.	♄ ☍ Hor.	=46 39
♀ □ M. C.	♀ ☌ Hor.	=19 41	♄ ☐ M. C.	♄ ☐ Hor.	=63 5
♀ ∠ M. C.	♀ ∠ Hor.	=73 16	♄ ☍ M. C.	♄ △ Hor.	=79 31
☿ △ M. C.	☿ ☌ Hor.	= 3 49	♃ ☌ M. C.	♃ △ Hor.	=13 47
☉ ☐ M. C.	☉ ∠ Hor.	= 9 34	♃ ∠ M. C.	♃ ☐ Hor.	=23 28
♅ ☍ M. C.	♅ ✶ Hor.	=16 34	♃ ✶ M. C.	♃ ☍ Hor.	=33 8

Since the A.D.'s in a corresponding pair of directions to the two Angles are identically the same, except in regard to the Quintile series, those to M.C. alone may be calculated. As the two of a pair are inseparables their combined effect may be read in regard to the directions to M.C.

Contention II.—The Arcs of Directions to the Horizon need not be calculated.

LESSON III

MUNDANE PARALLEL

30. Primary Directions to the Mundane Parallel.—Two points are in mundane parallel when they are one on each side of the same meridional half or on the same side of opposite meridional halves, with the ratios between their semi-arcs and their distances from the same or opposite meridional half equal. These two kinds of parallels constitute two different types, as will be seen presently. In directions to parallel as in those to aspects of the position of bodies, only one body is moved to the parallel of its own position at birth or to that of another body at birth, but never to the parallel of an angle. The D.B. may be moved clockwise resulting in direct mundane parallels or anti-clockwise resulting in converse mundane parallels.

31. The Different Types of Mundane Parallels.—The definition of a mundane parallel given in Article 30, admits of four patterns of mundane parallels, shown in Figure V.

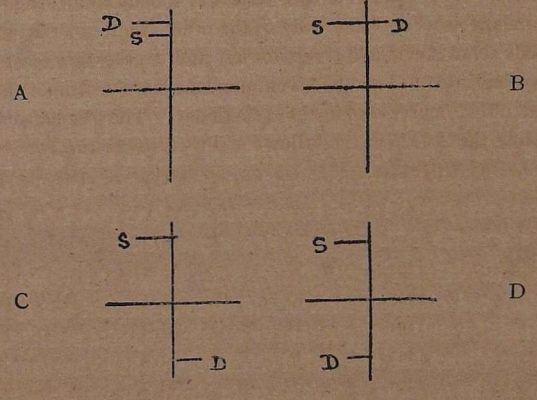


Fig. V.—A. D.B. and S.P. are on the same side of meridian and horizon.

B. D.B. and S.P. are on the opposite sides of meridian and the same side of horizon.

C. D.B. and S.P. are on the opposite sides of the meridian and hor.

D. D.B. and S.P. are on the same sides of meridian and opposite sides of horizon.

Figure V—A is nothing but mundane conjunction, and Figure V—C. is nothing but mundane opposition: so these two patterns of mundane parallel should be ruled out, as otherwise one and the same aspect will receive two different names, and so will tend to convey different significance. Figure V—B. is indisputably a mundane parallel upon the meridian, and Figure V—D. may be taken to be a mundane parallel but it is evidently more a parallel upon the horizon than upon the meridian. Though some writers do question these parallels upon the horizon, I shall discuss their calculation as well, and leave it to the reader to adopt them or not. I shall speak of the former as Mundane Parallels of Type No. 1, and of the latter as Mundane Parallels of Type No. 2. Therefore, we have.

Rule XVII.—Mundane parallels of Type 1 are formed with the D.B. and the S.P. on opposite sides of the meridian but on the same side of the horizon: and those of Type 2 are formed with the D.B. and the S.P. on the same side of the meridian but on opposite sides of the horizon.
In other words those of Type 1 are upon the same meridional half, and those of Type 2 are upon opposite meridional halves, shutting out what really are conjunctions and oppositions.

32. Primary Directions to Mundane Parallels.—In these directions one of the nine celestial bodies is the D.B., and the position at birth of one of the nine celestial bodies is the S.P. At birth only a very few or no pairs of bodies are in mundane parallel. But the diurnal rotation of the heavens shifts bodies causing them to move clockwise through the mundane quadrants in succession. During this clockwise rotation, a D.B. is brought to occupy a distance proportionate to its semi-arc, either from the other side of the same meridlonal half to that of S.P., or from the same side of the opposite meridional half as that of S.P. Again, in direct mundane parallels the arc of direction is the clockwise angle from the D.B. to its position at the parallel: and in converse mundane parallels, it is the anti-clockwise angle from the D.B. to its position at parallel.

33. The Meridional Half of Parallel.—Since the position of a body at birth is fixed, and since the D.B. should come to parallel either on the same meridional half as the stationary position or on the opposite meridional half to it, therefore, the meridional half of parallel (M.H.P.) will be either on the same side of the horizon as the stationary position as in Type 1 or on the opposite side of the horizon as in Type 2. Therefore, we have,

Rule XVIII.—The meridional half of parallel in Type 1 is the one on the same side of the horizon as the stationary position at birth: and in Type 2 is the one on the side of the horizon opposite to that occupied by the S.P. at birth.

34. The Meridional Distance of D.B.—We have seen in Article 32, that the A.D. is measured from the position of the D.B. at birth to the position of

D.B. at parallel, and both the positions are expressed in distance from the meridian of parallel. So, we have to take (i) the M.D. of D.B. at birth, and (ii) the M.D. of D.B. at parallel, in both cases from the M.H.P. In Type 1 the M.D. of D.B. at birth is taken similar, diurnal or nocturnal, to the S.P. And the M.D., diurnal or nocturnal, of S.P. is taken according as it is above or below its horizon; for the M.H.P. is similar to S.P. at birth. In Type 2 the M.D. of D.B. at birth is taken opposite to the S.P. at birth, for the M.H.P. is opposite to the S.P. So we have,

Rule XIX.—In Type 1 the birth M.D. of D.B. is to be taken similar to that of S.P. at birth, and in Type 2 it is to be taken opposite to that of S.P. at birth.

It should be evident that the first or birth M.D. of D.B., to be spoken of hereafter as merely the M.D. of D.B., is similar to the M.H.P. in both the Types.

35. Moderation of the Meridional Distance of the Stationary Position.—In Article 30 it was stated that in mundane parallels, the ratio between the S.A. and the M.D. of D.B. should be equal to that between the S.A. and the M.D. of S.P. To find the meridional distance of the D.B. at which the two ratios would be equal, we have to moderate the meridional distance of the S.P. from the meridional half of parallel to the semi-arc of the D.B. at parallel. So we have to find the S.A. of D.B. at parallel, and to moderate the birth M.D. of S.P. to it. In Type 1, the M.H.P. is similar to the S.P. at birth, so S.A. of D.B. is to be taken similar to S.A. of S.P. at birth, e.g., both are to be taken alike, diurnal or nocturnal. In Type 2, M.H.P. is opposite to S.P. at birth, so S.A. of D.B. is to be taken opposite to S.A. of S.P. at birth, which is the S.A. of D.B. at parallel. So we have,

Rule XX.—In Type 1, the S.A. of D.B. at parallel is taken similar to S.A. of S.P. at birth, and in Type 2, it is taken opposite to S.A. of S.P. at birth.

Now the birth M.D. of S.P. is to be moderated to the S.A. of D.B. at parallel :—

Birth S.A. of S.P : Birth M.D. of S.P : : S.A. of D.B. at parallel : mod. M.D. of S.P.

For example, in the direct mundane parallel, Type 1, of Neptune to Jupiter, S.P. is diurnal, so the M.H.P. and the S.A. of D.B. are both diurnal.

The S.A. of S.P. is 58° 4′, its M.D. 5° 35′, S.D.A. of Neptune is 93° 19′. So. moderate as :—

58° 4′ : 5° 35′ : : 93° 19′ : moderated M.D. of S.P.

1·01703 + 0·28531 = 1·30234, T.P.L. of 8° 58′, which is the moderated M.D. of S.P.

Again in the direct mundane parallel, Type 2, of Saturn to Jupiter, S.P. is diurnal, so the M.H.P. and S.A. of D.B. are nocturnal. The S.A. of S.P. at birth is 58° 4′ and its M.D. 5° 35′, and S.N.A. of Saturn is 98° 38′. So moderate as :—

58° 4′ : 5° 35′ : : 98° 38′ : moderated M.D. of S.P.

1·01700 + 0·26125 = 1·27828, T.P.L. of 9° 29′. Therefore, we have,

Rule XXI.—Moderate birth M.D. of S.P. :—

Birth S.A. of S.P. : Birth M.D. of S.P. : : S.A. of D.B. at ∥ : mod. M.D. of S.P.

36. The Arc of Direction.—It was stated in Article 34 that to find the A.D. we have to take (i) the M.D. of D.B. at birth and (ii) the M.D. of D.B. at parallel which is nothing but the moderated M.D. of S.P. discussed in Article 35. Let us now proceed to determine the A.D. The various possible permutations of the birth positions of D.B.'s and those of S.P.'s in Type 1, may be grouped under four heads ;—

(i) when D.B. crosses the M.H.P. (see Fig. VI A and VII A) ;

(ii) when D.B. crosses the M.H. opposite to M.H.P. (see Fig. VI B and VII B) ;

(iii) when D.B. does not cross the M.H.P. (see Fig. VI C & D, and VII C & D) ;

(iv) when D.B. crosses both M. H's. (see Fig. VI E & F and VII E & F).

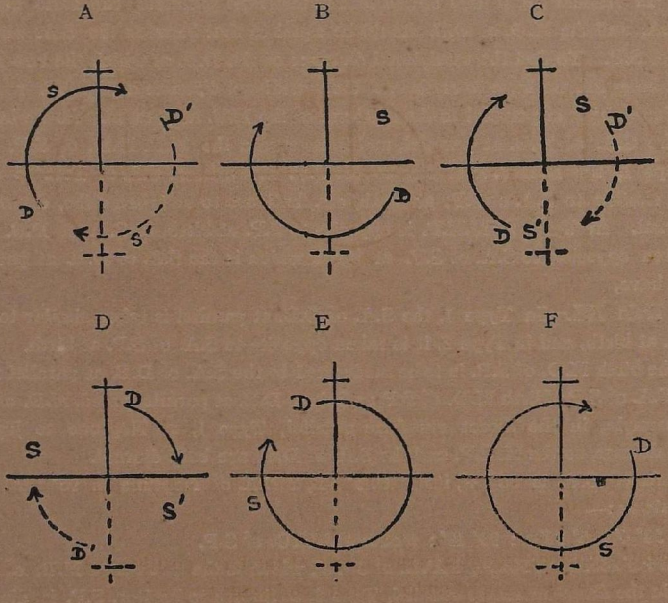


Fig. VI—Direct Mundane Parallels of Type 1.

In each figure the M.H.P. is indicated by a straight line and the M.H. opposite to the M.H.P. by a dotted line.

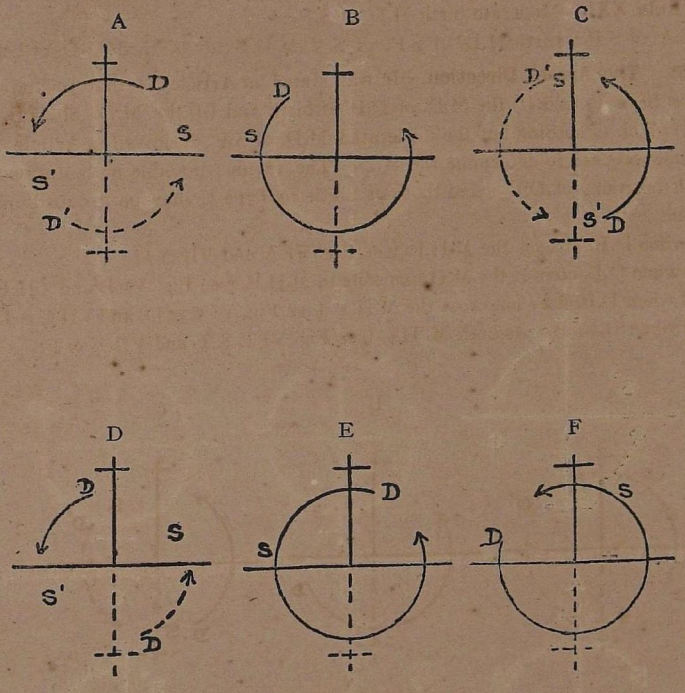


Fig. VII—Converse Mundane Parallels of Type 1.

In each figure the M.H.P. is indicated by a straight line, and the M.H. opposite to the M.H.P. by a dotted line.

And the various possible permutations of the birth positions of D.B. and S.P. in Type 2, may be grouped under similar four heads :—

(i) When D.B. crosses the M.H.P. (see Fig. VIII A and IX A.)

(ii) When D.B. crosses the M.H. opposite to M.H.P. (see Fig. VIII B and IX B.)

(iii) When D.B. does not cross the M.H.P. (see Fig. VIII C & D and IX C and D.)

(iv) When D.B. crosses both M.H.'s (see Fig. VIII E & F and IX E & F.)

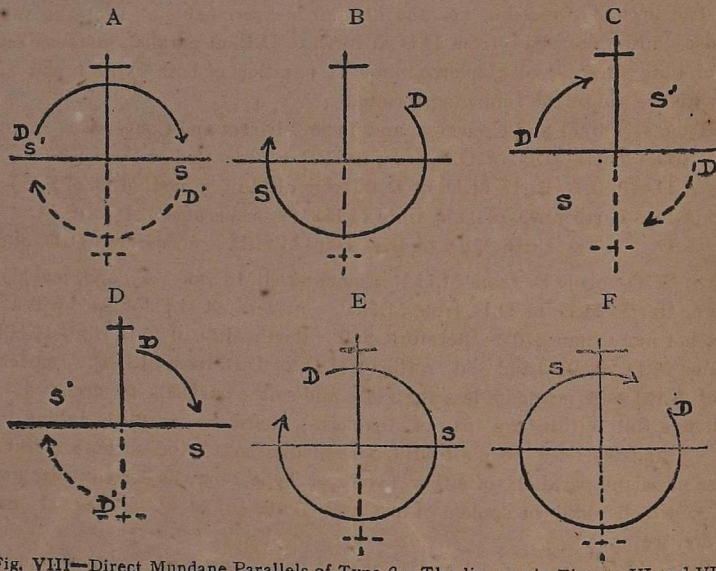


Fig. VIII—Direct Mundane Parallels of Type 2.—The lines as in Figures VI and VII.

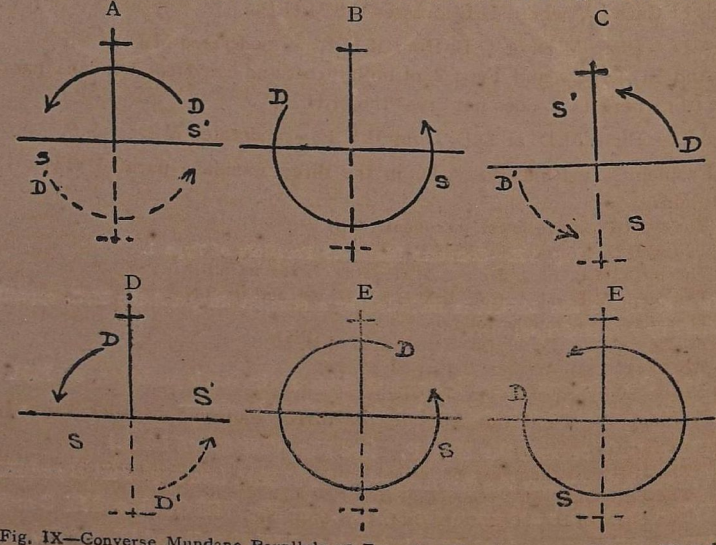


Fig. IX—Converse Mundane Parallels of Type 2.—The lines as in Figures VI and VII.

The arcs of direction, i.e., the angular measurements of the arcs running clockwise [anti-clockwise] from D.B at birth to D.B. at parallel, in these several cases of both direct and converse mundane parallels of both Types 1 and 2, are found with the aid of the following formulæ :—

Type 1. Direct and Converse, and Type 2 Direct and Converse.

(1) A.D. = Birth M.D. of D.B. from M.H.P. + moderated M.D. of S.P.

(2) A.D. = 360° – (Birth M.D. of D.B. from M.H.P. + mod. M.D. of S.P.)

(3) A.D. = Birth M.D. of D.B. from M.H.P. ~ moderated M.D. of S.P.

(4) A.D. = 360° – (Birth M.D. of D.B. from M.H.P. ~ moderated M.D. of S.P.)

As (birth M.D. of D.B. from M.H.P. + moderated M.D. of S.P.) and, much more therefore, (birth M.D. of D.B. from M.H.P. ~ moderated M.D. of S.P.) will at the most be not more than 270°; therefore, 360° – (birth M.D. of D.B. from M.H.P. + moderated M.D. of S.P.) and 360° – (birth M.D. of D.B. from M.H.P. ~ moderated M.D. of S.P.) will never be less than 90°, and so the parallels of groups (2) and (4) will not fall within the span of 90 years. Therefore, parallels falling under groups (2) and (4) may be omitted from calculations. And so both direct and converse mundane parallels of either Type 1 or Type 2 may be sorted under groups 1 and 3, which shall be spoken of as Cases (i) and (ii) of both Types 1 and 2. Therefore, we have

Rule XXII.—In Type 1 and Type 2 of both direct and converse mundane parallels of Case (i), where D.B. crosses the M.H.P.,

A.D. = Birth M.D. of D.B. from M.H.P. + moderated M.D. of S.P.

And in Type 1 and Type 2, of both direct and converse mundane parallels of Case (ii), where D.B. does not cross the M.H.P.,

A.D. = Birth M.D. of D.B. from M.H.P. ~ moderated M.D. of S.P.

Problem 17—Find the A.D. in the direct mundane parallel, Type 1, of Moon to Mars.

The M.H.P. is the lower meridional half.

☽, the D.B., crosses the M.H.P.

The birth M.D. of ☽ from L.M.H. is 89° 7′ and its S.N.A. is 93° 20′.

The birth M.D. of ♂ from L.M.H., is 37° 28′, and its S.N.A. is 62° 29′.

Therefore, moderate as follows :—

62° 29′ : 37° 28′ : : 93° 20′ : moderated M.D. of ♂.

0·22212 + 0·28524 = 0·50736 ,T.P.L. of 55° 58′.

Case (i) A.D. = 89° 7′ + 55° 58′ = 145° 5′ (late).

Problem 18—Find the A.D. in the direct mundane parallel, Type 1, of Neptune to Jupiter.

The M.H.P. is the upper meridional half. ♆, the D.B., does not cross the M.H.P.

The birth M.D. of ♆ from U.M.H. is 99° 3′, and its S.D.A. is 93° 19′.

The birth M.D. of ♃ from U.M.H. is 5° 35′ and its S.D.A. is 58° 4′.

The sign ~ means deduct the less term from the greater.

∴ 58° 4′ : 5° 35′ : : 93° 9′ : : moderated M.D. of ♃.

1·01703 ÷ 0·28531 = 1·30234, T.P.L. of 8° 58.′

Case (ii) A.D. = 99° 3′ − 8° 58′ = 96° 5′ (late).

Problem 19—Find the A.D. in the direct mundane parallel, Type 1, of Uranus to Mars.

The M.H.P. is the lower meridional half, ♅, the D.B., does not cross the M.H.P.

The birth M.D. of ♅ from L.M.H. is 2° 22′ and its S.N.A. is 56° 48′.

The birth M.D. of ♂ from L.M.H. is 37° 28′, and its S.N.A. is 62° 29′.

∴ 62° 29′ : 37° 28′ : : 56° 48′ : moderated M.D. of ♂.

Case (ii) A.D. = 34° 4′ − 2° 22′ = 31° 42′.

To calculate the A.D.'s of isolated mundane parallels, it will do to prepare a schedule of the ternary proportional logarithms of the ratios of the S.A. of S.P.'s at birth to their birth M.D.'s, and to note the T.P.L.'s of S.D.A.'s and S.N.A.'s of D.B.'s.

Schedule IX—The T.P.L.'s of S.A. of S.P : M.D. of S.P.

S. P.'s in their order in the nativity.	Constant T. P. L. of S. A. of S. P. at birth : Its M. D. at birth	T.P.L. of S.D.A. of D.B.	T.P.L. of S.N.A. of D.B.
♆	86° 41′ : 80° 57′ 0·02972	93° 19′ 0·28531	86° 41′ 0·31734
♀	72° 50′ : 53° 9′ 0·13683	107° 10′ 0·22521	72° 50′ 0·39294
☿	71° 36′ : 43° 55′ 0·21228	108° 24′ 0·22024	71° 36′ 0·40036
☉	59° 9′ : 19° 54′ 0·47310	120° 51′ 0·17303	59° 9′ 0·48332
♅	56° 48′ ; 2° 22′ 1·38022	123° 12′ 0·16466	56° 48′ 0·50092
♂	62° 29′ : 37° 28° 0·22212	117° 31′ 0·18517	62° 29′ 0·45951
☽	93° 20′ : 89° 7′ 0·02007	86° 40′ 0·31742	93° 20′ 0·28524
♄	81° 22′ : 67° 36′ 0·08050	81° 22′ 0·34483	98° 38′ 0·26125
♃	58° 4′ : 5° 35′ 1·01703	58° 4′ 0·49135	121° 56′ 0·16915

Schedule X—M.D. of S.P.'s moderated to S.D.A. or S.N.A of D.B.

S.P.'s.	S.N.A. or S.D.A.	D.B.'s ♆	♀	♄	☉	♅	♂	☽	♄	♃
♆	D	87° 9′	100° 5′	101°14′	112°52′	115° 3′	109°45′	80°56′	75°59′	54°14′
	N	80 57	68 1	66 52	55 14	53 3	58 21	87 10	92 7	113 52
♀	D	68 6	78 12	79 6	88 11	89 54	85 45	63 15	59 22	42 22
	N	63 15	53 9	52 15	43 10	41 27	45 36	68 6	71 59	88 59
♄	D	57 14	65 44	66 29	74 7	75 34	72 5	53 9	49 54	35 37
	N	53 10	44 40	43 55	36 17	34 50	38 19	57 15	60 30	74 47
☉	D	31 23	36 3	36 28	40 39	41 27	39 32	29 9	27 22	19 32
	N	29 10	24 30	24 5	19 54	19 6	21 1	31 24	33 11	41 1
♅	D	3 53	4 28	4 31	5 2	5 8	4 54	3 37	3 23	2 25
	N	3 37	3 2	2 59	2 28	2 22	2 36	3 53	4 7	5 5
♂	D	55 57	64 16	65 0	72 28	73 52	70 28	51 58	48 47	34 49
	N	51 59	43 40	42 56	35 28	34 4	37 28	55 58	59 9	73 17
☽	D	89 6	102 20	103 30	115 23	117 38	112 12	82 45	77 41	55 26
	N	82 46	69 32	68 22	56 29	54 14	59 40	89 7	94 11	116 26
♄	D	77 32	89 2	90 4	100 24	102 21	97 39	72 0	67 36	48 15
	N	72 1	60 31	59 29	49 9	47 12	51 54	77 33	81 57	101 18
♃	D	8 58	10 18	10 25	11 37	11 51	11 18	8 20	7 49	5 35
	N	8 20	7 0	6 53	5 41	5 27	6 0	8 58	9 29	11 43

Exercise 32 – Find the A.D. in the direct mundane parallel, Type 1, of Sun to Venus in the standard nativity.

Exercise 33 – Find the A.D. in the direct mundane parallel, Type 1, of Mars to Jupiter in the standard nativity.

Exercise 34 – Find the A.D. in the direct mundane parallel, Type 2, of Neptune to Sun in the standard nativity.

Exercise 35 – Find the A.D. in the converse mundane parallel, Type 1, of Neptune to itself in the standard nativity.

Exercise 36 – Find the A.D. in the converse mundane parallel, Type 1, of Uranus to Saturn in the standard nativity.

Exercise 37 – Find the A.D. in the converse mundane parallel, Type 2, of Moon to Mars in the standard nativity.

37. Determination of A.D.'s in the mundane parallels of all bodies to different S.P's.—In the primary directions of bodies to mundane aspects of angles and bodies we may take the bodies one by one as the directed body, as D.B.'s play the leading part. But in the primary directions of all bodies to the mundane paralles of the positions of bodies we may better take the stationary positions of bodies one by one, as the S.P.'s play the leading part. First, note whether the stationary position is above or below its horizon; and in Type 1 take the birth S.A. and M.D. of the S.P. and the S.A. of D.B. similar to S.P., and moderate the birth M.D. of S.P. to the similar S.A. of D.B.: and in Type 2 take the birth S.A. and M.D. of S.P. also as at birth, but the S.A. of D.B. opposite to S.A. of S.P., and moderate the M.D. of S.P. to the opposite S.A. of D.B. Now, see if D.B. has to cross or not the M.H.P. to parallel the S.P., accordingly settle whether the parallel is of Case (i) or (ii), and proceed to find the A.D. applying Rule XXII. In most cases it can be readily judged by mere inspection whether a D.B. has to cross or not the M.H.P. without actually carrying out all the tedious moderations. So a schedule of M.D.'s of S.P.'s only for cases when D.B. has to cross or not the M.H.P. need be moderated to the particular S.A. of D.B. All the same, in Schedule X the M.D.'s of every S.P. stand moderated to both S.D.A. and S.N.A. of every D.B.

Exercise 38 – Prepare the schedule of the birth M.D.'s of S.P.'s moderated to (a) S.D.A. and (b) S.N.A. of every D.B. in the standard nativity.

LESSON IV

RAPT PARALLEL

38. Rapt Parallel—In all directions described till now, only one body was moved while the other remained stationary. But in a direction to rapt parallel both the bodies are simultaneously moved while the equatorial arc between them remains the same. Angles do not form rapt parallel. The equatorial arc with a body at its either end may be compared to a garland with a pendant at each end. Two bodies are said to be in rapt parallel when they stand at distances from a meridional half, proportionate to their S.A.'s appropriate to the M.H. A rapt parallel is a primary direction, since it is formed within 24 sidereal hours after birth, and is caused by the apparent diurnal rotation of the heavens. And it is a mundane direction, because the arc of direction is measured upon the equatorial arc. In direct rapt parallel the arc is moved clockwise to the meridional half of parallel: and in converse rapt parallel the arc is moved anti-clockwise to the meridional half of parallel.

39. Direct Body and the Passive Body—The two bodies concerned in a rapt parallel are known as the Directed Body (D.B.) and the Passive Body (P.B.), there being no S.P. In a direct rapt parallel the **directed body** is the one at the anti-clockwise end of the equatorial arc: and in a converse rapt parallel it is the one at the clockwise end of the equatorial arc. In either case, the body at the other end of the equatorial arc is the **passive Body**. The D.B. always pushes before it the P.B. but never drags the P.B.

40. Arc of Parallel—In a rapt parallel the equatorial arc between the D.B. and the P.B. is the **arc of parallel** (A.P.), for it is the one that is moved clockwise [anti-clockwise] to the meridional half of parallel (M.H.P.). In direct rapt parallel, the arc of parallel is measured clockwise from D.B. to P.B.: and in converse rapt parallel, anti-clockwise from D.B. to P.B. Since the A.D. obtained, with one arc parallelled upon an M,H.P. is identically the same as the A.D. obtained with the other arc parallelled upon the other M.H.P.; therefore, it will do, if one and only one of the two arcs between a D.B. and a P.B., which are the explements of one another, is taken—the clockwise arc from D.B. to P.B. in direct ones, and the anti-clockwise arc from D.B. to P.B. in converse ones. The angular measurement in equatorial degrees of the clockwise A.P. is obtained by deducting the right ascensional degrees and minutes of P.B. from the right ascensional degrees and minutes of D.B.; and the measurement of the anti-clockwise A.P. in converse ones by deducting the R.A. of D.B. from

the R.A. of P.B. If the R.A. to be deducted from is numerically less than that of the other, add 360° to it and then deduct.

Dictum III—When the angle to be deducted from is numerically less than the other, add 360° to it.

But whether the difference is more than 180° or not, leave it as it is with no rectification.

So Dictum II does not apply here. For, we want only the clockwise or anti-clockwise arc but not the shorter distance, the aspect being a parallel and not an angular one. For example, in the direct rapt parallel of Saturn to Sun, the R.A. of Saturn is 203° 16′ and the R.A. of Sun is 70° 58′, and so the A.P. is 203° 16′—70° 58′ i.e., 132° 18′; and in the converse rapt parallel of Neptune to Mars, the R.A. of Neptune is 9° 55′ and the R.A. of Mars is 128° 20′, so the A.P. is 128° 20′—9° 55′, i.e., 118° 25′. Therefore. we have

Rule XXIII.—In direct rapt parallels, A.P. = R.A. of D.B.—R.A, of P.B. Add 360° to the R.A. to be deducted from, if it is numerically less.

In converse ones A.P. = R.A. of P.B.—R.A. of D.B.

41 Meridional Half of Parallel—In direct rapt parallells, D.B. is moved to its **first clockwise M.H.** (Case i), and if no rapt parallel is formed on the first clockwise M.H., the D.B. is moved continuously or in the same clockwise manner to its **second clockwise M.H.** (Case ii). In converse rapt parallels, the D.B. is moved to its **first anti-clockwise M.H.** (Case i), and if no rapt parallel is formed on the first anti-clockwise M.H., the D.B. is moved continuously or in the same anti-clockwise manner to its **second anti-clockwise M.H.** (Case ii). For example, in the direct rapt parallel of Saturn to Sun, the first clockwise M.H. is L.M.H., and the second clockwise M.H. is the U.M.H. : and in the converse rapt parallel of Neptune to Mars, the first anti-clockwise M.H. is the L.M.H. and the second anti-clockwise M.H. is the U.M.H. Therefore, we have

Rule XXIV.—In Case (i) of direct and converse rapt parallels, the M.H.P. is the first clockwise or anti-clockwise M.H. of D.B. : in Case (ii) of direct and converse rapt parallels the M.H.P. is the second clockwise or anti-clockwise M.H. of D.B.

42. The First M.D. of D.B.—In direct rapt parallels the mundane distance **at birth** of the D.B. from its first or second clockwise M.H., as the case may be, is the **first M.D. of D.B.** In converse rapt parallels the mundane distance **at birth** of the D.B. from its first or second anti-clockwise M.H., as the case may be, is the **first M.D. of D.B.** For example. in the direct rapt parallel of Saturn to Sun, in Case (i), the first M.D. of Saturn is its L.M.D. 112° 24′, and in Case (ii) the first M.D. of Saturn is its U.M.D. 67° 36′. In the converse rapt parallel of

Neptune to Mars of Case (i) the first M.D. of Neptune is its L.M.D. 80° 57', and of Case (ii) the first M.D. of Neptune is its U.M.D. 99° 3'. Therefore, we have

Rule XXV—The first M.D. of D.B. is always the birth M.D. of D.B. taken appropriate to the M.H.P.

43. The Second M.D. of D.B.—In direct rapt parallels, the mundane distance **at parallel** of the D.B. from its M.H.P. is the **second M.D. of D.B.** In converse rapt parallels the mundane distance **at parallel** of the D.B. from its M.H.P. is the **second M.D. of D.B.** It is obtained in both direct and converse rapt parallels by dividing the A.P. proportionately to the S.A.'s of D.B. and of P.B. at parallel. The division is carried out as follows :—

S.A. of D.B. at ∥ + S.A. of P.B. at ∥ : S.A. of D.B. at ∥ : : A.P. : 2nd M.B. of D.B.

For example, in the direct rapt parallel of Saturn to Sun the first clockwise M.H. is L.M.H., the sum of the S.N.A.'s of Saturn and Sun is 98° 38' + 59° 9', i.e., 157° 47', the S.N.A. of Saturn is 98° 38', and the A.P. is 132° 18' (see Schedule XI).

∴ 157° 47' : 98° 38' : : 132° 18' : the second M.D. of D.B.

∴ (a.c.) 9·94279 + 0·26125 + 0·13371 = 0·33775, T.P.L. of 82° 42'.

∴ The second M.D. of D.B. is 82° 42'.

Again, in the direct rapt parallel of Neptune to Mars, the first clockwise M.H. is U.M.H., the sum of the S.D.A.'s of Neptune and Mars is 93° 19' + 117° 31' i.e., 210° 50', the S.D.A. of Neptune is 93° 19' and the A.P. is 241° 35' (see Schedule XI).

∴ 210° 50' : 93° 19' : : 241° 35' the second M.D. of D.B. from U.M.H.

∴ 21° 5' : 93° 19' : : 24° 9'5' the second M.D. of D.B.

(a.c.) 9·06867 + 0·28531 + 0·87221 = 0·22619, the T.P.L. of 106° 56', the second M.D.

One tenth of the first and the third term have been taken to bring their values below 180° for which only T.P.L.'s are given in the Tables (see Articles 51 and 200 of Mathematical Astrology). Therefore, we have

Rule XXVI.—In all cases, the second M.D. of D.B. is obtained as :—

S.A. of D.B. at ∥ + S.A. of P.B. at ∥ : S.A. of D.B. at ∥ : : A.P. : 2nd M.D. of D.B.

44. Arc of Direction—The arc of direction is the equatorial arc through which D.B. is moved clockwise in direct, or anti-clockwise in converse rapt parallels from its mundane position at birth to its mundane position at parallel. It is the arc from first M.D. to second M.D. from M.H.P. In Case (i) of both direct and converse rapt parallels, the first M.D. of D.B. is greater than the second M.D. of D.B., and the A.D. is obtained by deducting the second M.D. of D.B. from the first M.D. of D.B., (see Fig. X A and XI A). And in Case (ii) of both direct and converse rapt parallels, the first M.D. of D.B. is less than the second M.D. of D.B., and the A.D. is obtained by deducting the sum of the first

M.D. of D.B. and the second M.D. of D.B. from 360°, (see Fig. X B and XI B.) For example, in the direct rapt parallel of Saturn to Sun the first M.D. of Saturn is 112° 24′, and the second M.D. of Saturn is 82° 42′.

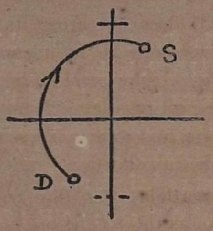


Fig. X A.

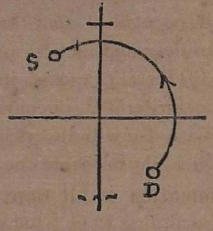


Fig. XI A.

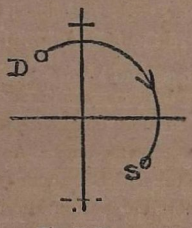


Fig. X B.

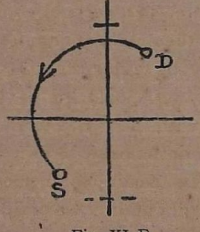


Fig. XI B.

Direct. – Rapt Parallels.—Converse.

Case (i) A.D. = 112° 24′ – 82° 42′ = 29° 42′.

And in the direct rapt parallel of Neptune to Mars the first M.D. of Neptune is 99° 3′, and the second M.D. of Neptune is 106° 56′. As the first M.D. of D.B. is less than the second M.D of D.B., the parallel is upon the second clockwise M.H. or L.M.H. So a fresh moderation has to be made appropriate to the L.M.H. as follows, the sum of the S.N.A's. of Neptune and Mars is 86° 41′ + 62° 29′, i.e., 149° 10′, the S.N.A. of Neptune is 86° 41′, and the A.P. the same 241° 35′ (see Schedule XI) :—

149° 10′ : 86° 41′ : : 241° 35′ : the second M.D. of D.B. from L.M.H.

14° 55′ : 86° 41′ : : 24° 9·5′ : the second M.D. of D.B.

(a.c.) 8·91840 + 0·31734 + 0·87221 = 0·10795, T.P.L. of 140° 23′.

The second M.D. of D.B. is 140° 23′ and the first M.D. or L.M.D. of Neptune is 80° 57′.

Case (ii) A.D. = 360° – (80° 57′ + 140° 23′) = 360° – 221° 20′ = 138° 40′.

The A.D. is beyond the span settled upon, and so the rapt parallel will be late in life. Therefore, we have

Rule XXVII.—In Case (i) of both direct and converse rapt parallels,

A.D. = the first M.D. of D.B.—the second M.D. of D.B. from M.H.P.

In Case (ii) of both direct and converse rapt parallel,

A.D. = 360° – (first M.D. of D.B. + second M.D. of D.B. from M.H.P.)

In Case (i) it will be evident that the D.B. does not cross its first clockwise M.H. in direct parallels, and its first anti-clockwise M.H. in converse parallels: but that in Case (ii) the D.B. crosses its first clockwise M.H. in direct parallels, and its first anti-clockwise M.H. in converse rapt parallels. It may be stated that rapt parallels of Case (ii) will always be late, and so may very well be ignored leaving only Case (i) as the probable one to be calculated.

45. Determination of all Rapt parallels—For this purpose, a certain age limit has, as usual, first to be fixed upon, as there is no use in calculating arcs of directions that may point to a time too long after birth. Having settled upon an age limit, (i) enter in a vertical column all the possible permutations of two bodies taken at a time in some definite order to avoid any possible permutation escaping notice, say by taking the D.B. next clockwise to L.M.H. in direct ones and the D.B. next anti-clockwise to U.M.H. in converse ones, pairing each D.B. in succession with the P.B.'s more and more clockwise to it in direct ones, and more and more anti-clockwise to it in converse ones. As there are 9 bodies to act as D.B.'s of the remaining 8 bodies, for a D.B. cannot from a rapt parallel with itself, so we will obtain 9 × 8 or 72 possible permutations. (ii) Next, enter similarly, the M.D. of each D.B. at birth from its first clockwise M.H. in direct ones, and from its first anti-clockwise M.H. in converse ones, and note as well whether the first M.D. of D.B. is from upper or lower M.H. (iii) Next, determine the A.P.'s of each permutation of bodies, and enter similarly half of it as the **approximate** second M.D. of D.B. For, the S.A. of either D.B. or P.B. is only about a few degrees more or less than 90°, and so the S.A. of D.B. is always very nearly half the sum of the two S.A.'s. Therefore, A.P. which has to be divided into two parts proportionately to the S.A.'s, may be halved and taken as the very approximate second M.D. of D.B. (iv) Now by mere inspection, decide whether the first M.D. of D.B. is greater than the second M.D. of D.B., and whether the difference between the two M.D.'s falls within the age limit. If so, it is a probable rapt parallel of Case (i); if not, the rapt parallel will be too late in formation. And when the first M.D. of D.B. is less than its second M.D., then add the two M.D.'s and see if the explement of their sum falls within the age limit. If so, it is a probable rapt parallel of Case (ii); if not, it will be too late. And lastly, (v) determine the A.D. of Case (i) or of Case (ii) if necessary, finding the first M.D. of D.B. from M.H.P., and by a fresh moderation the second M.D. of D.B. from M.H.P. It may be observed that the possible number of permutations of Case (ii) will be about half the number of those of Case (i), i.e., 36.

To facilitate the calculation of all rapt parallels, a schedule containing (i) the R.A.'s of bodies with the difference in R.A. between two consecutive bodies, (ii) both the S.A.'s of every body, noting the birth ones, and (iii) both the M.D.'s of every body, noting the birth ones, may be preliminary prepared; (see schedule XI).

Schedule XI—The R.A.'s, S.A.'s and M.D.'s of Bodies.

Bodies.	R.A.	Diff. of R.A.	S.A. Diur.	S.A. Noct.	M.D. Upper	M.D. Lower
♆	9° 55′	104° 38′	93° 19′	**86° 41′**	99° 3°	**80° 57′**
♀	37 43	27 48	107 10	**72 50**	126 51	**53 9**
☿	46 57	9 14	108 24	**71 36**	136 5	**43 55**
☉	70 58	24 1	120 51	**59 9**	160 6	**19 54**
♅	88 30	17 32	123 12	**56 48**	177 38	**2 22**
♂	128 20	39 50	117 31	**62 29**	142 32	**37 28**
☽	179 59	51 39	86 40	**93 20**	90 53	**89 7**
♄	203 16	23 17	**81 22**	98 38	**67 36**	112 24
♃	265 17	62 1	**58 4**	121 56	**6 35**	174 25

N. B.—The birth S.A.'s and M.D.'s are set in thick types in the schedule.

Exercise 39—Prepare a schedule of the R.A.'s, S.A's and M.D.'s of bodies in the standard nativity.

Problem 20—Find the A.D. of the direct rapt parallel of Uranus to Mars.

The Cl. D. or A.P. from Uranus to Mars = 360° + 88° 30′ − 128° 20′ = 320° 10′.

The first clockwise M.H.P. is U.M.H.

First M.D. of D.B. is the U.M.D. of Uranus at birth = 177° 38′.

S.D.A. of Uranus + S.D.A. of Mars = 123° 12′ + 117° 31′ = 240° 43′.

240° 43′ : 123° 12′ : : 320° 10′ : the second M.D. of D.B.

120° 21″5 : 123° 12′ : : 160° 5′ : ,,

(a.c.) 9·82520 + 0·16466 + 0·05093 = 0·04079, T.P.L. of 163° 52′.

Case (i) A.D. = 177° 38′ − 163° 52′ = 13° 46′.

∴ A.D. of ♅ R.P. ♂ (Dir.) is 13° 46′.

Problem 21—Find the A.D. of the direct rapt parallel of Venus to Mars.

The Cl. D. or A.P. from Venus to Mars. = 360° + 37° 43′ − 128° 20′ = 269° 23′.

The First Cl. M.H. is U.M.H.

First M.D. of D.B. is the U.M.D. of Venus = 126° 51′.

S.D.A. of Venus + S.D.A. of Mars = 107° 10′ + 117° 31′ = 224° 41′.

224° 41′ : 107° 10′ ; : 269° 23′ : the second M.D. of D.B.

112° 20′′5 : 107° 10′ : : 134° 41′′5 : „

(a.c.) 9·79527 ÷ 0·22521 + 0·12593 = 0·14641, T.P.L. of 128° 29′.

First M.D. of D.B. is less, so parallel afresh on the second Cl.M.H .or L.M.H.

A.P. is same, i.e., 269° 23′.

The first M.D. of ♀ is its L.M.D. 53° 9′.

S.N.A. of Venus + S.N.A. of Mars = 72° 50′ + 62° 29′ = 135° 19′.

135° 19′ : 72° 50′ : : 269° 23′ : the second M.D. of D.B. from M.H.P.

67° 39′5 : 72° 50′ : : 134° 41′′5 : „

(a.c.) 9·57505 + 0·39294 + 0·12593 = 0·09392, T.P.L. of 145° 0′.

Case (ii) A.D. = 360° − (53°9′ + 145° 0′) = 161° 51′.

∴ A.D. of ♀ R.P. ♂ (Dir.) is 161° 51′, which will be late.

Exercise 40—Find the A.D.'s of all the direct rapt parallels of Mars to all other bodies in the standard nativity.

Exercise 41—Find the A.D.'s of all the converse rapt parallels of Saturn to all other bodies in the standard nativity.

LESSON V

PRIMARY ZODIACAL DIRECTIONS

46. Primary Zodiacal Directions—Primary zodiacal directions are called primary, for they are formed within 24 sidereal hours after birth, and so earlier than the secondary directions to be taken up next. Primary zodiacal directions are on all fours, so far as they can be, with the primary mundane directions, except in regard to certain points. The most outstanding difference is that primary zodiacal directions rest on the phenomenon of the anti-clockwise annual motion of bodies, while the primary mundane directions rest on that of the clockwise apparent diurnal rotation of the heavens. Though primary zodiacal directions rest on anti-clockwise annual motion of bodies, yet (i) their zodiacal motion is taken to be at the rate of the apparent diurnal rotation of the heavens, and (2) arcs of directions are measured upon the ecliptic and then referred to the equator, and are made to measure time similarly to primary mundane directions. So the aspects are first measured upon the ecliptic and then referred to the equator. Theoretically speaking, primary zodiacal directions may be to the position of one of the two angles or of a body, to zodiacal parallel, and to zodiacal rapt parallel.

47. Primary Zodiacal Directions of the Angles and to the Bodies—In primary mundane directions to angles, the latter are deemed to be the S.P.'s and the bodies to be the D.B.'s. But in primary zodiacal directions, the angles are deemed to be the D.B.'s and the bodies to be the S.P.'s. So in primary zodiacal directions of angles, the angles are written first, e.g., M.C. △ ☉, while in primary mundane directions the angles are written second, e.g., ☉ △ M.C. And in primary zodiacal directions of bodies to aspects of positions of bodies, the bodies, as usual, are the D.B.'s and the positions are the S.P.'s. Subject to this difference, and the consequent alterations, primary zodiacal directions of angles, and those to bodies may be discussed together as it was done in the case of mundane directions.

48. Direct and Converse Directions—The phenomenon underlying primary zodiacal directions being the anti-clockwise annual motion of bodies, all directions in which the D.B.'s, whether an angle or a body, are moved anti-clockwise are the direct ones, and those in which the D.B. are moved clockwise are the converse ones.

49. Shorter Distance—In direct directions we require the anti-clockwise zodiaeal distance from D.B. (angle or body) to S.P., and in converse ones the clockwise zodiacal distance from D.B. to S.P. The anti-clockwise zodiacal dis-

tance in direct directions is obtained by deducting the D.B.'s celestial longitude from the S.P.'s celestial longitude. The clockwise zodiacal distance in converse ones is obtained by deducting the S.P.'s longitude from D.B.'s longitude. When the longitude to be deducted from is numerically less than the other, add 360° to it and then deduct. For example, the anti-clockwise distance in the direct direction of Jupiter to Neptune is 360° 0′ + 10° 10′ − 265° 40′. i.e., 104° 30′: and the clockwise distance in the converse one of M.C. to Sun is 270° 47′ − 72° 26′, i.e., 198° 21′. Therefore, we have.

Rule XXVIII—Anti-clockwise distance from D.B. to S.P. = S.P.—D.B.

Clockwise distance from D.B. to S.P. = D.B.—S.P.

And when the longitude to be substracted from is less than the other, add 360° to it and then deduct.

But we require always the shorter distance between D.B. and S.P., for all aspect angles are less than 180°. The shorter distance is the anti-clockwise or clockwise distance itself when it does not exceed 180°; but when it exceeds 180°, the shorter distance is always obtained by deducting the anti-clockwise or clockwise distance from 360°. For example, the anti-clockwise distance from Jupiter to Neptune being 104° 30′, is itself the S.D., but the clockwise distance from M.C. to Sun being 198° 21′, the shorter distance from M.C. to Sun is 360° 0′ − 198° 21′, i.e., 161° 39′. Therefore, we have,

Rule XXIX—S.D. = Acl. D. or Cl. D., when the latter is less than 180°.

S.D. = 360°—Acl. D. or Cl. D., when the latter is greater than 180°.

When the anti-clockwise or clockwise distance has not been rectified to obtain the shorter distance, the direction, whether direct or converse, is one of Case (i): and when the anti-clockwise or clockwise distance has been rectified to obtain the shorter distance, the direction, whether direct or converse, is one of Case (ii).

50. The First Aspect Angle and the Subsequent Ones—In Case (i) of direct and converse ones, that is, when the anti-clockwise or clockwise distance has not been rectified to obtain the shorter distance, the first aspect angle is just less than the shorter distance, and the subsequent ones decrease till conjunction and then increase. In Case (ii) of direct and converse ones, that is, when the anti-clockwise or clockwise distance has been rectified to obtain the shorter distance, the first aspect angle is just greater than the shorter distance, and the subsequent ones increase till opposition and then decrease. For example, in the direct directions of Jupiter to Neptune the unrectified shorter distance is 104° 30′, so the first aspect angle is the one just less than the S.D., i.e., square or 90°, and the subsequent ones decrease from square up to conjunction, and then they increase, e.g., sextile to conjunction, and then to sextile, square and so on. And in

the direct direction of the M.C. to Moon the rectified shorter distance is 89° 44′, so the first aspect angle is the one just greater than the S.D., i.e., square or 90°, and the subsequent ones increase from trine up to opposition, and then they decrease, e.g., trine to opposition, and then trine, square and so on. Therefore we have,

Rule XXX—In Case (i) the first aspect angle is just less than S.D., and the subsequent ones decrease till conjunction, and then increase.

In Case (ii), the first aspect angle is just greater than S.D., and the subsequent ones increase till opposition, and then decrease.

51. The Position of the D.B. at the end of a Direction—Aspect angles are the zodiacal aspect extents. They are always measured from the S.P.'s towards the D.B.'s as in primary mundane directions; but clockwise in direct ones and anti-clockwise in converse ones. The point where the measurement ends is termed the **limit** or the position of the D.B. at the end of the direction. In direct directions the limit will be anti-clockwise of the D.B., and in converse ones it will be clockwise of the D.B.

Whether S.D. has been obtained by rectification or not, (1) in direct directions the limit of an aspect from opposition to conjunction, i.e., of the decreasing series, is the S.P.'s longitude minus the aspect angle, (2) in direct directions the limit of an aspect from conjunction to opposition, i.e., of the increasing series, is the S.P.'s longitude plus the aspect angle ; (3) in converse ones the limit of an aspect from opposition to conjunction, i.e., of the decreasing series, is the S.P.'s, longitude plus the aspect angle, and (4) in converse ones the limit of an aspect from conjunction to opposition, i.e., of the increasing series, is the S.P.'s longitude minus the aspect angle.

For example, (1) in the direct direction of Jupiter to the decreasing square of Neptune, the limit is the zodiacal point 360° 0′ + 10° 10′ − 90° 0′, i.e., 280° 10′ : (2) in the direct direction of M.C. to the increasing square of Moon, the limit is the zodiacal point 181° 3′ + 90° 0′, i.e., 271° 3′ : (3) in the converse direction of Uranus to the decreasing sextile of Neptune, the limit is the zodiacal point 10° 10′ + 60°, i.e., 70° 10. : and (4) in the converse direction of the Ascendant to the increasing square of Uranus, the limit is the zodiacal point 360° 0′ + 88° 37′ − 90° 0′, i.e., 358° 37′. Therefore, we have.

Rule XXXI—In Cases i and ii of a direction,

(1) in direct ones to a decreasing and in converse ones to an increasing aspect, Limit's long. = S.P.'s long.—Aspect Angle :

(2) in direct ones to an increasing and in converse ones to a decreasing aspect, Limit's long. = S.P.'s long. + Aspect Angle.

The limits have always to be taken with no latitude, that is, as if they were ecliptic points, in calculating their R.A.'s, O.A.'s, S.A.'s and M.D.'s required for determining the A.D's in the different kinds of primary zodiacal directions, a subject to be discussed presently (see Schedule XV).

52. The Arc of Direction in directions of the Angles—So far, the description applies in common to directions of M.C., Ascendant, and Bodies to the positions of bodies. But from this point the methods vary.

Whether the direction is of Case (i) or (ii), (1) in direct ones of M.C. to the positions of bodies, the A.D. is the limit's R.A. minus the D.B.'s (M.C.'s) R.A.: (2) in converse ones of M.C., the A.D. is the D.B.'s (M.C.'s) R.A. minus the limit's R.A.: (3) in direct ones of the Ascendant to the positions of bodies, the A.D. is the limit's O.A.H. (Oblique Ascension when at the horizon, see Mathematical Astrology Art. 100) minus the Ascendant's O.A.H.: and (4) in converse ones of the Ascendant, the A.D. is the Ascendant's O.A.H. minus the limit's O.A.H. For example, in the direct directions of the Meridian to Moon the A.D. is limit's R.A. or 271° 9′—M.C.'s R.A. or 270° 52′, i.e., 0° 17′; and in the converse direction of the Ascendant to Jupiter (where the clockwise distance is 360°+ 2° 3′—265° 40′, i.e., 96° 23′, the first aspect is Ascendant square Jupiter, and the limit 265° 40′ + 90′, i.e., 355° 40), the A.D. is the Ascendant's O.A.H. or 0° 52′ minus the limit's O.A.H. or 358° 10′, i.e., 2° 42′. Therefore, we have

Rule XXXII.—In both Cases (i) and (ii),

(1) In the direct direction of M.C., A.D. = Limit's R.A. – M.C.'s. R.A.
In the converse directions of M.C., A.D. = M.C.'s R.A. – Limit's R.A.

(2) In the direct directions of the Ascendant, A.D. = Limit's O.A.H. – Asc.'s O.A.H.
In the converse ones of the Ascendant, A D. = Asc.'s O.A.H. – Limit's O.A.H.

53. The Arc of Direction in directions of Bodies—First, take the **birth** M.D. of the directed body taken with latitude, from the meridional half appropriate to the limit. Next, moderate the M.D. of the limit to the S.A. of the directed body taken with latitude and appropriate to the limit. Therefore, we have

Rule XXXIII—Take the limit with no latitude, and moderate its M.D. to the S.A. of the D.B. taken with latitude and appropriate to the S.A. of the limit:—

Limit's S.A.: limit's M.D.:: S.A. of D.B. : mod. M.D. of limit.

In the directions of bodies also two cases arise, as the D.B. crosses or not its first M.H.:—

(i) when the directed body has not to cross its first anti-clockwise meridional half in direct directions [first clockwise M.H. in converse ones] to reach the limit (see Fig. XII A. and XIII A).

(ii) when the directed body has to cross its first anti-clockwise meridional half in direct directions [first clockwise M.H. in converse ones] to reach the limit (see Fig. XII B and XIII B).

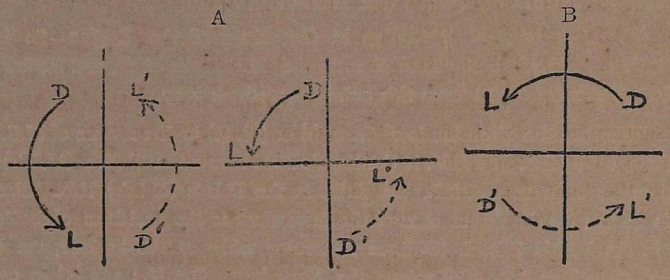


Fig. XII—Direct Primary Zodiacal Directions.

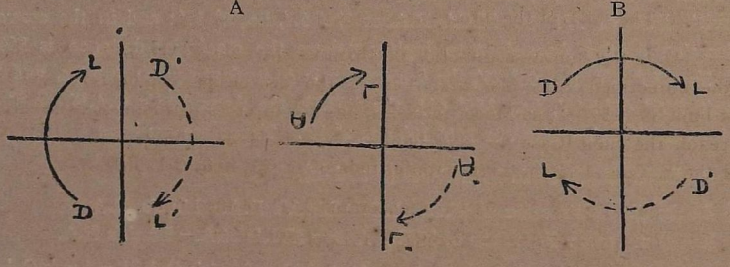


Fig. XIII—Converee Primary Zodiacal Directions.

(1) In the direct directions of Mars to Moon the Acl. D. is 55° 28′ which is the unrectified S.D., the first A.E. is the decreasing conjunction, and the first limit is 181° 3′; so Mars, the D.B., has not to cross its first anti-clockwise M.H. to reach the limit (Case i). The limit's S.N.A. is 90° 31′, and its L.M.D. is 90° 6′, and the S.N.A. of Mars taken with latitude is 62° 29′, and its L.M.D. 37° 28′.

∴ 90° 31′ : 90° 6′ : : 62° 29′ : moderated M.D. of the limit.
0·00201 + 0·45951 = 0·46152, T.P.L. of 62° 12′.
Mars, the D.B., when taken with latitude, its L.M.D. is 37° 28′.
∴ A.D. = 62° 12′ − 37° 28′ = 24° 44′, Case (i).
∴ The A.D. of the direct ♂ ☌ ☽ is 24° 44′.

(2) In the converse direction of Uranus to Neptune, the Cl. D. is 78° 27 which is the unrectified S.D., the first A.E. is the decreasing sextile, and the first limit is 70° 10′; so Uranus, the D.B., has not to cross its first clockwise

M.H. to reach the limit (Case i). The limit's S.N.A. is 59° 43′, and its L.M.D. 22° 20′, and the S.N.A. of Uranus taken with latitude is 56° 48′, and its L.M.D. 2° 22′.

∴ 59° 43′ : 22° 20′ : : 56° 48′ : moderated M.D. of the limit.
0·42714 + 0·50092 = 0·92806, T.P.L. of 21° 15′
∴ A.D. = 21° 15′ − 2° 22′ = 18° 53′
∴ The A.D. of the converse ♅ ✶ ♆ is 18° 53′.

(3) In the direct direction of Venus to Uranus, the Acl. D. is 48° 58′ which is the unrectified S.D., the first A.E. is the decreasing conjunction, and the first limit is 88° 37′; so Venus, the D.B., has not to cross its first anti-clockwise M.H. to reach the limit (Case i). The limit's S.N.A. is 57° 9′, and its L.M.D. 2° 22′, and the S.N.A. of Venus taken with latitude is 72° 50′, and its L.M.D. 53° 9′.

∴ 57° 9′ : 2° 22′ : : 72° 50′ : moderated M.D. of the limit.
1·38288 + 0·39294 = 1·77582, T.P.L. of 3° 1′.
∴ A.D. = 53° 9′ − 3° 1′ = 50° 8′.
∴ The A.D. of the direct ♀ ☌ ♅ is 50° 8′.

(4) In the converse direction of Moon to Mars the Cl. D. is 55° 28′ which is the unrectified S.D., the first A.E. is the decreasing conjunction, and the first limit is 125° 35′; so Moon, the D.B., has not to cross its first clockwise M.H. to reach the limit (Case i). The limit's S.N.A. is 64° 41′, and its L.M.D. 37° 5′; and the S.N.A. of Moon taken with latitude is 93° 20′, and its L.M.D. 89° 7′.

∴ 64° 41′ ; 37° 5′ : : 93° 20′ : moderated M.D. of the limit.
∴ 0·24161 + 0·28524 = 0·52685, T.P.L. of 52° 31′.
∴ A.D. = 89° 7′ − 52° 31′ = 36° 36°.
∴ The A.D. of the converse ☽ ☌ ☌ is 36° 36′.

(5) In the direct direction of Jupiter to Neptune, the Acl. D. is 104° 30′ which is the unrectified S.D., the first A.E. is the decreasing square, and the first limit is 280° 10′; so Jupiter, the D.B., has to cross its first anti-clockwise M.H. to reach the limit (Case ii). The limit's S.D.A. is 57° 50′, and its U.M.D. 10° 12′; and the S.D.A. of Jupiter taken with latitude is 58° 4′, and its U.M.D. 5° 35′.

57° 50′ : 10° 12′ : : 58° 4′ ; moderated M.D. of the limit.
∴ 0·75358 + 0·49135 = 1·24493, T.P.L. of 10° 14′.
∴ A.D. = 10° 14′ + 5° 35′ = 15° 49′.
∴ The A.D. of the direct ♃ □ ♆ is 15° 49′.

(6) In the converse direction of Mars to Uranus the Cl. D. is 36° 58′ which is the unrectified S.D., the first A.E. is the decreasing conjunction, and the first limit is 88° 37′; so Mars, the D.B., has to cross its first clockwise M.H. to

reach the limit (Case ii). The limits's S.N.A. is 57° 9′, and its L.M.D. 2° 22′; and the S.N.A. of Mars taken with latitude is 62° 29′, and its L.M.D. 37° 28′.

∴ 57° 9′ : 2° 22′ ; : 62° 29′ : moderated M.D. of the limit.
1·38288 + 0·45951 = 1·84239, T.P.L. of 1° 35′.
∴ A.D. = 37° 28′ + 1° 35′ = 39° 3′.
∴ The A.D. of the converse ☌ ♂ ♅ is 39° 3′. Therefore, we have

Rule XXXIV.—In Case (i) where D.B. has not to cross its first M.H.,
A.D. = M.D. of D.B. ~ mod. M.D. of limit.
In Case (ii) where D.B. has to cross its first M.H.,
A.D. = M.D. of D.B. + mod. M.D. of limit.

To facilitate calculations of primary zodiacal directions **to bodies** (i) a schedule of the S.D.'s between the various permutations of bodies taken two a time, noting whether each was obtained by rectification or not (see Schedule XIII), (ii) a schedule of the limits of all the aspects, both of the decreasing and the increasing series, of every body, (see Schedule XIV), and (iii) a schedule of the longitudes, semi-arcs, meridional distances, right ascensions, and oblique ascensions when on the horizon of the birth-place, and the ternary proportional logarithms of the ratios of the S.A's to the M.D'.s of all the various zodiacal limits of every body (see Schedule XV) may be preliminarily prepared. This last schedule is in fact an extensive speculum of the limits taken with no latitude. The reader will do well to calculate the A.D.'s in a series of directions of the same body to all others, when he will realise that with the change in the position of the limit the nature of all arcs change, as shown in the working of the above examples.

54. Directions to Zodiacal Parallel.—This is mathematically impossible. No amount of manipulation can influence the apparent diurnal rotation of the heavens to alter the annual motion in the declination of bodies.

55. Directions to Zodiacal Rapt Parallel.—It is a rigid impossibility to direct a body to the zodiacal rapt parallel of another body, for the annual motions of the several bodies vary vastly and independently of each other.

Problem 22—Find the A.D.'s of the direct primary zodiacal directions of M.C. to Saturn.

The rectified Acl. D. from M.C. to ♄ is 66° 41′.
(1) The first A.E. is the increasing □, and first limit is 294° 6′.
The R.A. of 294° 6′ is 296° 0′, and the R.A. of M.C. is 270° 52′.
∴ The A.D. of M.C. □ ♄ (direct) = 296° 0′ − 270° 52′ = 25° 8′.

(2) Again, the next A.E. is △, and the limit is 324° 6′.
The R.A. of 324° 6′ is 326° 25′, and the R.A. of M.C. is 270° 52′.
∴ The A.D. of M.C. △ ♄ (direct) = 326° 25′ − 270° 52′ = 55° 33′.

Problem 23—Find the A.D's. of the converse primary zodiacal directions of the Ascendant to Jupiter.

The unrectified Cl. D from the Ascendant to Jupiter is 96° 23′.

(1) The first A.E. is the decreasing □, and the first limit is 355° 40′.
The O.A.H. of the limit is 358° 10′, and the O.A.H. of the Ascendant is 0° 52′.
∴ The A.D. of Asc. □ ♃ (converse) = 360° 52′ − 358° 10′ = 2° 42′.

(2) Again, the next A.E. is ✶, and the limit is 325° 40′.
The O.A.H. of the limit is 344° 40′, and the O.A.H. of the Ascendant is 0° 52′.
∴ The A.D. of Asc. ✶ ♃ (converse) = 360° 52′ − 344° 40′ = 16° 12′.

(3) Again, the next A.E. is ☌, and the limit 265° 40′.
The O.A.H. of the limit is 298° 0′, and the O.A.H. of the Ascendant is 0° 52′.
∴ The A.D. of Asc. ☌ ♃ (converse) = 360° 52′ − 298° 0′ = 62° 52′.

Problem 24—Find the A.D.'s of the direct primary zodiacal directions of Mars to Moon.

The unrectified Acl. D. from Mars to Moon is 55° 28′.

(1) The first A.E. is the decreasing ☌, and the limit is 181° 3′.
The S.N.A. of the limit is 90° 31′, and its L.M.D. is 90° 6′.
The birth S.N.A. of D.B. taken with lat. is 62° 29′, and its L.M.D. is 37° 28′.
∴ 90° 31′ : 90° 6′ : : 62° 29′ : moderated M.D. of S.P.
0·00201 + 0·45951 = 0·46152, T.P.L. of 62° 13′.
∴ The A.D. of ☌ ☌ ☽ (direct) = 62° 13′ − 37° 28′ = 24° 44′.

(2) The D.B.'s M.D.. being less, further directions will be late.

Schedule XII—S.A's. and T.P.L.'s of Bodies taken with and without latitude.

Bodies.	S.A. with lat.	T.P.L.	S.A. with no lat.	T.P.L.
♆	86° N 41	0·31734	84 N 57	0·32611
♀	72 N 50	0·39294	70 N 50	0·40503
☿	71 N 36	0·40036	67 N 2	0·42898
☉	59 N 9	0·48332	59 N 9	0·48332
♅	56 N 48	0·50092	57 N 9	0·49826
♂	62 N 29	0·45951	64 N 41	0·44448
☽	93 N 20	0·28524	90 N 31	0·29854
♄	81 D 22	0·34483	78 D 7	0·36253
♃	58 D 4	0·49135	57 D 17	0·49724

Schedule XIII—Shorter Distances, Rectified and Unrectified.

From.	To Asc.	To ♆	To ♀	To ☿	To ☉	To ♅	To ♂	To ☽	To ♄	To ♃	To M.C.
A.S.		8° 7′	37° 36′	46° 26′	70° 23′	86° 34′	123° 32′	179° 0′	[157° 57′]	[96° 23′]	[91° 16′]
♆	[8° 7′]		29 29	38 19	62 16	78 27	115 25	170 53	[166 4]	[104 30]	[99 23]
♀	[37 36]	[29 29]		8 50	32 47	48 58	85 56	141 24	164 27	[133 59]	[128 52]
☿	[46 26]	[38 19]	[8 50]		23 57	40 8	77 6	132 34	155 37	[142 49]	[137 42]
☉	[70 23]	[62 16]	[32 47]	[23 57]		16 11	53 9	108 37	131 40	[166 46]	[161 39]
♅	[86 34]	[78 27]	[48 58]	[40 8]	[16 11]		36 58	92 26	115 29	177 3	[177 50]
♂	[123 32]	[115 25]	[85 56]	[77 6]	[53 9]	[36 58]		55 28	78 31	140 5	145 12
☽	[179 0]	[170 53]	[141 24]	[132 34]	[108 37]	[92 26]	[55 28]		23 3	84 37	89 44
♄	157 57	166 4	[164 27]	[155 37]	[131 40]	[115 29]	[78 31]	[23 3]		61 34	66 41
♃	96 23	104 30	133 59	142 49	166 46	[177 3]	[140 5]	[84 37]	[61 34]		5 7
M.C.	91 16	99 23	128 52	137 42	161 39	177 50	[145 12]	[89 44]	[66 41]	[5 7]	

Figures not enclosed within braces are Acl.D's and unrectified S.D.'s or Cl.D's and rectified S.D.'s.

Figures enclosed within braces are Cl.D.'s and unrectified S.D.'s or Acl.D's and rectified S.D's.

Schedule XIV—Limits.

S.P's. in their order.	In Direct directions to Increasing aspects and in Converse directions to Decreasing aspects.																	
	☌		*		□		△		☍		△		□		*		☌	
☿	10°	10′	70°	10′	100°	10′	130°	10′	**190°**	**10′**	250°	10′	280°	10′	310°	10′	10°	10′
♀	39	39	99	39	129	39	159	39	**219**	**39**	279	39	309	39	339	39	39	39
☿	48	29	108	29	138	29	168	29	**228**	**29**	288	29	318	29	348	29	48	29
☉	72	26	132	26	162	26	192	26	**252**	**26**	312	26	342	26	12	26	72	26
♅	88	37	148	37	178	37	208	37	**268**	**37**	328	37	358	37	28	37	88	37
♂	125	35	185	35	215	35	245	35	**305**	**35**	5	35	35	35	65	35	125	35
☽	181	3	241	3	271	3	301	3	**1**	**3**	61	3	91	3	121	3	181	3
♄	204	6	264	6	294	6	324	6	**24**	**6**	84	6	114	6	144	6	204	6
♃	265	40	325	40	355	40	25	40	**85**	**40**	145	40	175	40	205	40	265	40

In Direct directions to Decreasing aspects and in Converse directions to Increasing aspects.

Schedule XV—Speculum of zodiacal Limits taken with no latitude.

Limit	R.A.	O.A.H.	S.A.	M.D.	T.P.L. of SA :M.D	Limit	R.A.	O.A.H.	S.A.	M.D.
1° 3′	0° 58′	0° 27′	90 D 31	90 U 6	0·00201	181° 3′	180° 58′	181° 29′	90 N 31	90 L 6
2 3	1 53	0 52	91 D 1	91 U 1	0·00000	182 3	181 53	182 54	91 N 1	91 L 1
5 35	5 7	2 21	87 N 14	85 L 45	0·00745	185 35	185 7	187 53	87 D 14	85 U 45
10 10	9 21	4 18	84 N 57	81 L 31	0·01792	190 10	189 21	194 24	84 D 57	81 U 31
12 26	11 26	5 16	83 N 50	79 L 26	0·02341	192 26	191 26	197 36	83 D 50	79 U 26
24 6	22 19	10 26	78 N 7	68 L 33	0·05674	204 6	202 19	214 12	78 D 7	68 U 33
25 40	23 47	11 8	77 N 21	67 L 5	0·06185	205 40	203 47	216 26	77 D 21	67 U 5
28 37	26 35	12 33	75 N 58	64 L 17	0·07252	208 37	206 35	220 37	75 D 58	64 U 17
35 35	33 17	15 57	72 N 40	57 L 35	0·10104	215 35	213 17	230 37	72 D 40	57 U 35
39 39	37 15	18 5	70 N 50	53 L 37	0·12094	219 39	217 15	236 25	70 D 50	53 U 37
48 29	46 1	23 3	67 N 2	44 L 51	0·17453	228 29	226 1	248 59	67 D 2	44 U 51
61 3	58 55	31 14	62 N 19	31 L 57	0·29013	241 3	238 55	266 36	62 D 19	31 U 57
65 35	63 40	34 35	60 N 55	27 L 12	0·35016	245 35	243 40	272 45	60 D 55	27 U 12
70 10	68 32	38 15	59 N 43	22 L 20	0·42714	250 10	248 32	278 49	59 D 43	22 U 20
72 26	70 58	40 7	59 N 9	19 L 54	0·47310	252 26	250 58	281 49	59 D 9	19 U 54
84 6	83 34	50 58	57 N 24	7 L 18	0·89559	264 6	263 34	296 10	57 D 24	7 U 18
85 40	85 17	52 34	57 N 17	5 L 35	1·01114	265 40	265 17	298 0	57 D 17	5 U 35
88 37	88 30	55 39	57 N 9	2 L 22	1·38288	268 37	268 30	301 21	57 D 9	2 U 22
90 47	90 52	58 1	57 N 9	0 L 0	Infinite	270 47	270 52	303 43	57 D 9	0 U 0
91 3	91 9	58 18	57 N 9	0 L 17	2·30471	271 3	271 9	304 0	57 D 9	0 U 17
99 39	100 30	68 15	57 N 45	9 L 38	0·77778	279 39	280 30	312 45	57 D 45	9 U 38
100 10	101 4	68 54	57 N 50	10 L 12	0·75358	280 10	281 4	313 14	57 D 50	10 U 12
108 29	110 1	79 24	59 N 23	19 L 9	0·49149	288 29	290 1	320 38	59 D 23	19 U 9
114 6	116 0	86 50	60 N 50	25 L 8	0·38389	294 6	296 0	325 10	60 D 50	25 U 8
121 3	123 16	95 19	63 N 3	32 L 24	0·28914	301 3	303 16	330 13	63 D 3	32 U 24
125 35	127 57	102 38	64 N 41	37 L 5	0·24161	305 35	307 57	333 16	64 D 41	37 U 5
129 39	132 6	108 22	66 N 16	41 L 14	0·20604	309 39	312 6	335 50	66 D 16	41 U 14
130 10	132 37	109 6	66 N 29	41 L 45	0·20206	310 10	312 37	336 8	66 D 29	41 U 45
132 26	134 54	112 19	67 N 25	44 L 2	0·17849	312 26	314 54	337 29	67 D 25	44 U 2
138 29	140 55	120 55	70 N 0	50 L 3	0·14570	318 29	320 55	340 55	70 D 0	50 U 3
144 6	146 25	128 57	72 N 32	55 L 33	0·11586	324 6	326 25	343 53	72 D 32	55 U 33
145 40	147 56	131 12	73 N 16	57 L 4	0·10852	325 40	327 56	344 40	73 D 16	57 U 4
148 37	150 46	135 25	74 N 39	59 L 54	0·09561	328 37	330 46	346 7	74 D 39	59 U 54
159 39	161 12	151 9	79 N 57	70 L 20	0·05566	339 39	341 12	351 15	79 D 57	70 U 20
162 26	163 48	155 5	81 N 17	72 L 56	0·04708	342 26	343 48	352 31	81 D 17	72 U 56
168 29	169 25	163 42	84 N 17	78 L 33	0·03060	348 29	349 25	355 8	84 D 17	78 U 33
175 40	176 1	173 52	87 N 51	85 L 9	0·01356	355 40	356 1	358 10	87 D 51	85 U 9
178 37	178 44	178 3	89 N 19	87 L 52	0·00711	358 37	358 44	359 25	89 D 19	87 U 52

Problem 25—Find the A.D.'s of the direct primary zodiacal directions of Mercury to Neptune.

The rectified Acl, D. from Mercury to Neptune is 38° 19′.

(1) The first A.E. is the increasing ✶, and the first limit is 70° 10′.
The S.N.A. of the limit is 59° 43′, and its L.M.D. is 22° 20′.
The S.N.A. of Mercury (D.B.) is 71° 36′, and its L.M.D. 43° 55′,
59° 43′ : 22° 20′ : : 71° 36′ : moderated M.D. of the limit.
0·42714 + 0·40036 = 0·82750, T.P.L. of 26° 47′.
Case i. The A.D. of ☿ ✶ ♆ (direct) = 43° 55′ − 26° 47′ = 17° 8′.

Here D.B.'s M.D. is greater.

(2) Again, the next A.E. is the increasing □, and the first limit is 100° 10′.
The S.N.A. of the limit is 57° 50′, and its L.M.D. 10° 12′.
The S.N.A. of Mercury (D.B.) is 71° 36′, and its L.M.D. 43° 55′.
57° 50′ : 10° 12′ : : 71° 36′ : moderated M.D. of the limit.
0·75358 + 0·40036 = 1·15394, T.P.L. of 12° 38′.
Case ii. The A.D. of ☿ □ ♆ (direct) = 43° 55′ + 12° 38′ = 56° 33′.

The rest will be late.

Problem 26—Find the A.D.'s of the converse primary zodiacal directions of Jupiter to Saturn.

The unrectified Cl. D. from Jupiter to Saturn is 61° 34′.

(I) The first A.E. is the decreasing ✶, and the first limit is 264° 6′.
The S.D.A. of the limit is 57° 24′, and its U.M.D. 7° 18′,
The S.D.A. of Jupiter (D.B.) is 58° 4′, and its U.M.D. 5° 35′.
57° 24′ : 7° 18′ : : 58° 4′ : moderated M.D. of the limit.
0·89559 + 0·49135 = 1·38694, T.P.L. of 7° 23′.
Case i. The A.D. of ♃ ✶ ♄ (converse) = 7° 23′ − 5° 35′ = 1° 48′.

Here D.B.'s M.D. is less.

(2) Again, the next A.E. is the decreasing ☌, and the first limit is 204° 6′.
The S.D.A. of the limit is 78° 7′, and its U.M.D. 68° 33′.
The S.D.A. of Jupiter (D.B.) is 58° 4′, and its U.M.D. 5° 35′.
78° 7′ : 68° 33′ : : 58° 4′ : moderated M.D. of the limit.
0·05674 + 0·49135 = 0·54809, T.P.L. of 50° 57′.
Case i. The A.D. of ♃ ☌ ♄ (converse) = 50° 57′ − 5° 35′ = 45° 22′.

Here D.B.'s M.D. is less.

The rest will be late.

Problem 27—Find the A.D. in the converse primary zodiacal directions of Saturn to Mars.

The unrectified Cl, D. from Saturn to Mars is 78° 31′.

(1) The first A.E. is the decreasing ✶, and the first limit is 185° 35′.
The S.D.A. of the limit is 87° 14′, and its U.M.D. 85° 45′.
The S.D.A. of Saturn (D.B.) is 81° 22′, and its U.M.D. 67° 36′.
87° 14′ : 85° 45′ : : 81° 22′ : moderated M.D. of the limit.
0·00745 + 0·34483 = 0·35228, T.P.L. of 79° 59′.
Case i. The A.D. of ♄ ✶ ☌ (converse) = 79° 59′ − 67° 36′ = 12° 23′.

Here D.B.'s M.D. is less.

(2) Again, the next A.E. is the decreasing ☌, and the first limit is 125° 35′.
The S.N.A. of the limit is 64° 41′, and its L.M.D. 37° 5′.
The S.N.A. of Saturn (D.B.) is 98° 38′, and its L.M.D. 112° 24′.
64° 41′ : 37° 5′ : : 98° 38′ : moderated M.D. of the limit.
0·24161 + 0·26125 = 0·50286, T.P.L. of 56° 33′.
Case i. The A.D. of ♄ ☌ ☌ (converse) = 112° 24′ − 56° 33′ = 55° 51′.
Here D.B.'s M.D. is greater.
Note that in this problem the S.A. of D.B. changes from diurnal to nocturnal.

Problem 28—Find the A.D.'s of the converse primary zodiacal directions of Mars to Uranus.

The unrectified Cl. D. from Mars to Uranus is 36° 58′.
The first A.E. is the decreasing ☌, and the first limit is 88° 37′.
The S.N.A. of the limit is 57° 9′, and its L.M.D. 2° 22′.
The S.N.A. of Mars (D.B.) is 62° 29′, and its L.M.D. 37° 28′.
57° 9′ : 2° 22′ : : 62° 29′ : moderated M.D. of the limit.
1·38288 + ·045951 = 1·84239, T.P.L. of 2° 35′.
Case ii. The A.D. of ☌ ☌ ♅ (converse) = 37° 28′ + 2° 35′ = 40° 3′.
The rest will be late.

Exercise 42—Prepare the schedule of the Semi-arcs of bodies taken with latitude and without latitude, giving their T.P.L.'s as shown in Schedule XII, for the standard nativity.

Exercise 43—Prepare the schedule of Shorter Distances, indicating whether each has been obtained by rectificatiou or not, as shown in Schedule XIII, between every pair of bodies in the standard nativity.

Exercise 44—Prepare the schedule of the Limits of the different major aspects, of both the decreasing and increasing series, of every body in the standard nativity, similar to Schedule XIV.

Exercise 45—Prepare the schedule or speculum of the Longitudes, R.A.'s, O.A.H.'s, S.A.'s and M.D.'s of every limit taken with no latitude, and the T.P.L.'s of the ratios S.A.'s : M.D.'s of all the limits taken with no latitude, for the standard nativity, as shown in Schedule XV.

Exercise 46—Calculate the A.D.'s of all the primary zodiacal direct directions of M.C. to the various bodies in the standard nativity.

Exercise 47—Calculate the A.D.'s of all the primary zodiacal converse directions of the Ascendant to the various bodies in the standard nativity.

Exercise 48—Calculate the A.D.'s of all the primary zodiacal direct directions of Mercury to the various bodies in the standard nativity.

Exercise 49—Calculate the A.D.'s of all the primary zodiacal converse directions of Saturn to the various bodies in the standard nativity.

56. Are Primary Zodiacal Directions Rational?—The first feature of primary zodiacal directions that provokes thought, is that the angles are made to act as D.B.'s. The angles are fixed points through which the various zodiacal points move clockwise caused by the apparent diurnal rotation of the heavens, and anti-clockwise caused by the annual motions of bodies. How can fixed points be possibly directed? Their direct directions are anti-clockwise, and their con-

verse ones clockwise, to be in consonance with the anti-clockwise annual motions of bodies; but in reality, as it is the bodies that move anti-clockwise, the directions of angles are taken contrariwise, that is, in their direct directions they are made to move anti-clockwise, and in their converse ones clockwise, which is opposed to what is admitted to be the case in the zodiacal directions. This change seems to have been adopted to get over the difficulty of having to determine the longitudes, the R.A.'s, and the oblique ascensions of the limits measured from the angles, when the angles are treated as S.P.'s which they really are.

The next point is that the limits are taken with no latitude, that is, they are treated as mere ecliptic points. For, to determine the celestial latitude of limits we have to know its declination and right ascension, which we know not. Hence declinations of limits are taken to be identical with those of ecliptic points having the same zodiacal longitude, that is, limits are treated as if they are mere ecliptic points, and their right ascensions, oblique ascensions, semi-arcs, and meridional distances are accordingly calculated. On the other hand, the limits can very approximately be assigned their birth latitudes, as they do not appreciably change during the few sidereal hours after birth, which is the ultimate basis of all primary directions. Should this right proceedure of taking limits with their birth latitudes be adopted, then the arcs of directions would be exactly the same as those of the "opposite" primary mundane directions, thus revealing the real identity between the primary zodiacal and the primary mundane directions.

The next point to be thought over is the practice of taking directed bodies with their birth latitudes. Such a procedure is opposed to the accepted fundamental principles of directions, namely, taking all arcs **similar**—all diurnal or all nocturnal, and all from upper M.H., or all from lower M.H. That the practice in vogue of taking D.B.'s with birth latitude is palpably objectionable, is revealed by the fact that a D.B. cannot very often be directed to the aspect of a body very close to it, and also by attempts to direct a body to the conjunction of its own position, in which latter cases the A.D. should, correctly speaking, be 0° 0′. For example, in the standard nativity in the direct direction of Venus to the sextile of Moon, the U.M.D. of D.B. at birth is 1° 5′, and the moderated U.M.D. of the limit is 0° 37′. Therefore, the limit has to be directed clockwise to effect a direct direction which is opposed to the accepted principle of having to move D.B.'s anti-clockwise in direct ones and clockwise in converse ones. Instances can be multiplied. Also, if the reader attempts to calculate the A.D.'s in the direct and converse directions of a body to its own birth position, almost in every case the A.D. obtained would point to the motion of D.B. contrariwise to the accepted principles. If on the other hand, the D.B.'s at birth are also taken with no latitude then the A.D.'s obtained would be 0° 0′. In con-

clusion, the A.D.'s in direct and converse primary zodiacal directions would be found to be practically the same as those obtained in the opposite primary mundane directions.

In fact the primary zodiacal directions seem to be a medley between the primary mundane directions and the secondary directions to be discussed presently. They seem to have been invented and adopted just to overcome the difficulty of having to calculate primary mundane directions in which mundane positions have to be expressed in houses and cuspal distances. Unanswerable objections to the adoption of primary zodiacal directions could be raised, when an attempt is made to calculate primary zodiacal parallels. No amount of mathematical manipulation could possibly change the declination of a body due to the diurnal rotation. Again, the primary zodiacal rapt parallel would be a rigid impossibility, for bodies in their annual motion have too widely varying rates of motion to render it possible for any two of them to be moved, maintaining the zodiacal distance between them constant. For these valid reasons, we have to give up the practice of adopting primary zodiacal directions. Some authors have, in vain, attempted to cure these defects by adopting new methods.

To enable the reader to readily appreciate my contention, (1) that primary zodiacal directions are nothing but sad apologies for primary mundane directions in which the limits of bodies are taken with no latitude, (2) that in calculating primary zodiacal directions the D.B.'s also should be taken with no latitude, and (3) that primary zodiacal directions as now calculated taking limits with no latitude and D.B.'s with latitude, are anything but a medley of the above two rational principles, I append below the A.D.'s of some primary mundane directions and their analogous primary zodiacal directions. The directions of bodies are calculated firstly, taking limits with no latitude and D.B.'s with latitude : secondly, taking both limits and D.B.'s with no latitude : and thirdly, taking both limits and D.B.'s with latitude—all worked out with reference to the standard nativity. It may be pointed out that in the case of the Angles, the direct primary mundane directions are analogous to the direct primary zodiacal directions and the converse mundane ones to the converse zodiacal ones. But that in the case of Bodies, the direct primary mundane direction are analogous to the converse primary zodiacal directions and vice-versa. In this exemplification, I have illustrated only directions to conjunction and opposition, as there is no complication in their cases.

Mundane Direct				Zodiacal Direct			
☉ ☌ M.C. =	48°	17′	M.C.	☌ ☉ =	48°	6′
☽ ☌ M.C. =	63	18	M.C.	☌ ☽ =	63	17
♄ ☌ M.C. =	68	59	M.C.	☌ ♄ =	69	7
☿ ☌ M.C. =	70	11	M.C.	☌ ☿ =	70	1

Mundane Direct				Zodiacal Direct			
♃ ☍ Asc. =	4°	24′	Asc.	☍ ♃ =	4°	13′
♅ ☍ Asc. =	6	23	Asc.	☍ ♅ =	6	6
☿ ✶ Asc. =	42	15	Asc.	✶ ☿ =	42	19

	Primary Mundane direction		Primary Zodiacal direction, limit with no latitude and D.B. with latitude (as usual)		Primary Zodiacal direction, limit and D.B. with no latitude		Primary Zodiacal direction, both limit and D.B. with latitude	
♃ ☌ ♅	conv.	1° 59′·7	1° 43′·0	dir.	1° 53′·1	dir.	1° 59′·7	dir.
☌ ☍ ♅	conv.	3 0·4	2 43·6	dir.	3 18·4	dir.	3 0·4	dir.
♄ ☌ ☽	dir.	5 17·5	5 33·0	conv.	5 40·2	conv.	5 15·7	conv.
☽ ☌ ♄	conv.	5 15·5	5 21·2	dir.	5 40·0	dir.	5 13·9	dir.
☿ ☌ ☽	dir.	7 0·2	7 15·9	conv.	6 39·1	conv.	6 58·4	conv.
♀ ☍ ♆	dir.	12 11·8	12 54·4	conv.	11 54·8	conv.	12 11·8	conv.
☉ ☌ ☽	conv.	15 19·0	15 3·1	dir.	15 3·0	dir.	15 20·7	dir.
☌ ☌ ♄	dir.	18 56·1	18 48·5	conv.	18 16·2	conv.	18 56·0	conv.
♄ ☍ ♃	conv.	19 54·8	19 44·4	dir.	19 36·0	dir.	19 54·6	dir.
♃ ☍ ♄	dir.	19 59·1	19 51·5	conv.	19 42·0	conv.	19 59·0	conv.
☉ ☌ ♄	conv.	20 35·9	20 40·3	dir.	20 43·2	dir.	20 35·9	dir.
♄ ☍ ♅	conv.	21 55·1	21 38·1	dir.	21 30·0	dir.	21 55·1	dir.
♅ ☍ ♄	dir.	21 59·1	21 51·6	conv.	21 35·9	conv.	21 59·1	conv.
☿ ☌ ☉	dir.	22 13·1	22 26·3	conv.	21 42·4	conv.	22 13·2	conv.
♃ ☍ ☽	dir.	25 18·5	25 34·3	conv.	26 25·1	conv.	25 16·6	conv.
♅ ☍ ☽	dir.	27 18·7	27 34·6	conv.	27 19·5	conv.	27 16·9	conv.
☌ ☌ ☉	dir.	39 36·9	39 36·6	conv.	39 9·1	conv.	39 36·7	conv.
♃ ☍ ☉	dir.	40 44·3	40 44·1	conv.	40 36·0	conv.	40 44·3	conv.
♅ ☍ ☉	dir.	42 45·1	42 44·9	conv.	42 31·4	conv.	42 45·1	conv.
♀ ☌ ☉	conv.	49 2·6	49 2·7	dir.	49 36·5	dir.	49 2·5	dir.
♆ ☍ ☉	conv.	61 50·3	61 50·3	dir.	62 17·4	dir.	61 50·1	dir.
♀ ☌ ☽	conv.	64 56·7	64 40·3	dir.	65 7·7	dir.	64 58·5	dir.
♀ ☌ ♄	conv.	70 25·8	70 33·6	dir.	70 58·5	dir.	70 26·0	dir.
♆ ☍ ♅	dir.	71 16·4	71 32·0	conv.	70 31·0	conv.	71 16·8	conv.
♆ ☍ ♃	dir.	73 7·8	73 17·4	conv.	72 15·9	conv.	73 8·0	conv.

The disparity in the arcs of directions in other cases not mentioned in the above Table, is due to the dissimilarity in the various arcs taken.

Contention III—Primary Zodiacal directions are Irrational.

LESSON VI

MEASUREMENT OF TIME

57. Is the Correction of the arc of direction for the annual motion of the directed body not necessary ?—In all primary directions to mundane aspects and parallels discussed in Lessons II, III, and IV, the annual motion of the directed body has not been taken into consideration. Strictly speaking, it should be taken into account, as the directed body is an actual body which has its own annual motion, contrary or similar to the clockwise rotation (see Article 58). If the directed body is a stationary one, then the correction will not be required. The annual motion of all celestial bodies, other than the Moon during six sidereal hours, equivalent to 90° of A.D., which is the maximum span, is at the most, as in the case of Mercury, about 40 minutes of arc. But in the case of the Moon it may be as much as about 4 degrees. So the arcs in the directions, especially those of the Moon, should always be corrected for its eastward annual motion.

58. Determination of the Correction for the annual motion of a directed body—First, determine the daily motion in R.A. of the D.B. on the date of birth. As one solar day is equal to 1444 sidereal minutes, so the motion in 4 sidereal minutes during which period the arc of direction increases by one degree, is the daily motion divided by 361. So the correction for every degree in the A.D. is 1/361 of the D.B.'s daily motion in R.A. And the correction is always **positive** in the cases of Moon, Sun, and the planets in direct course, but **negative** in the cases of the retrograde planets. For, in the case of the sun, moon and the direct planets they always move anti-clockwise in their annual motion, and so the apparent rotation of the heavens has not only to rotate the calculated arc of direction, but also the arc moved anti-clockwise by the directed body during the sidereal time of rotation due to its annual motion : whereas in the case of the retrograde planets they move clockwise, and so the apparent rotation of the heavens has to rotate the calculated arc of direction less the arc moved clockwise by the directed body. If the twelve-hourly motion in R.A. of a body is taken, then we have to deduct or add 1/180th part of the twelve-hourly motion for every degree in the arc of direction. If the six-hourly motion in R.A. of a body is taken, then we have to deduct or add 1/90th part of the six-hourly motion for every degree in the arc. And if the hourly motion is taken, then we have to deduct or add 1/15th part of the hourly motion for every degree in the arc.

Problem 29.—Find the correction for the annual motion of the directed body in the direct primary mundane directions of (i) Moon to the opposition of M.C., the A.D. being 89° 7′, (ii) Moon to the trine of the Horizon, the A.D. being 58° 18′, (iii) Moon to the sextile of Sun, the A.D. being 21° 0′, and (v) Moon to the rapt parallel of Uranus, the A.D. being 32° 15′.

Let us find the daily motion of Moon from Greenwhich mean mid-night of June 2-3, 1865 to the Greenwich mean midnight of June 3-4, 1865.

R.A. of Moon at G.M.N. on June 2-3, 1865 is 11 h. 57 m. 30·89s.
" " " 3-4, " 12 h. 42 m. 33·90s.

∴ The daily motion of Moon in R.A. at birth was 0 h. 45 m. 3·01 s.
0 h. 45 m. 3·01 s. of R.A. in time is 11° 15′ 45″·15 of arc.
∴ 1-361th part of the daily motion is 0° 1′ 52″·3 of arc.

Therefore, the correction for annual motion to be applied in all directions of the Moon is 1′ 52″ for every degree in the arcs of directions. And the correction for Moon is always positive. Therefore, the positive corrections are (i) 2° 47′, (ii) 1° 49′, (iii) 1° 50′, (iv) 0° 39′ and (v) 1° 0′.

It may be observed that this correction should always be applied at least in the cases where the daily motion in R.A. of the directed body exceeds 20 minutes of are, as the time measured to in such a case would be about one month. But the important directions being those of bodies moving slowly such as ♃, ♄, ♅ and ♆, this correction may be ignored in regard to them.

59. The Measure of Time—In primary directions, mundane and zodiacal, every degree in the A.D. measures to one year. One ordinary year consists of 365 days, and one leap year of 366 days. So one minute of arc measures to 365 ÷ 60, i.e.. six and one-twelfth of a day in an ordinary year, and to 366 ÷ 60, i.e., six and one-tenth of a day in a leap year. Accordingly, every minute is made to measure six and one-twelfth of a day from the birth-date during the ordinary year, and six and one-tenth of a day from the birth-date in a leap year. The year is not **quite** the calendar year, but the calendar year from birth date to birth date. The leap year is not **quite** the calendar leap year, but the calendar year from the birth-date in which the month of February with 29 days occurs. The exact dates to which every minute of arc, from one to sixty, in both an ordinary and a leap year, measures may be arranged in tabular from to enable one to readily convert minutes in any A.D. into calendar dates. The year to which an A.D. measures is obtained by adding the number of degrees in the A.D. to the year of birth. For example, the A.D. 54° 16′ in George V's nativity, would measure to a date in the year, from 1-18 a. m. June 2-3, (1865 + 54) 1919, to 1-18 a. m. June 2-3, 1920, which is to be taken as a leap year, since February 1920 falling within the year consists of 29 days. And 16 minutes of arc in the A.D. measures in a leap year to 16 × 6·1, i.e., 98 days which counted from June 2-3 of 1919, falls on the 9th September 1919, so the arc of direction, 54° 16′, in George V's nativity, measures to the 9th September 1919. But the arc of direction 55° 16′ would measure to a date in the year from 1-18 a. m. 2-3 June, 1920, to 1-18 a. m. June 1921, which is to be taken as an ordinary year, since February 1921 falling within the year con-

sists of 28 days. And 16 minutes of arc in the A.D. measures in an ordinary year to 16 × 6'083, i.e., 97 days which counted from June 2-3 of 1920 falls on the 8th September 1920, and so the arc of direction, 55° 16', in George V's nativity, measures to the 8th September 1920. So a table of the dates in both an ordinary and a leap year to which every minute in the arc of direction, from one to sixty, would measure, should be prepared beforehand to facilitate the conversion of arcs into time to which they measure (see Schedule XVI). The scheduled dates should clinch the time of the native's life-incidents accurately, subject to a negative or positive error of one day, due to decimal approximation.

Schedule XVI—Dates measured to by every minute of arc in the A.D.'s.

Arc	In Ordinary year		In Leap year		Arc	In Ordinary year		In Leap year	
1'	June	9	**June**	**9**	31'	Dec.	9	**Dec.**	**9**
2	,,	15	,,	**15**	32	,,	15	,,	**15**
3	,,	21	,,	**21**	33	,,	21	,,	**21**
4	,,	27	,,	**27**	34	,,	27	,,	**27**
5	July	3	**July**	**4**	35	Jan.	2	**Jan.**	**3**
6	,,	10	,,	**10**	36	,,	8	,,	**9**
7	,,	16	,,	**16**	37	,,	14	,,	**15**
8	,,	22	,,	**22**	38	,,	20	,,	**21**
9	,,	28	,,	**28**	39	,,	26	,,	**27**
10	Aug.	3	**Aug.**	**3**	40	Feb.	1	**Feb.**	**2**
11	,,	9	,,	**9**	41	,,	7	,,	**8**
12	,,	15	,,	**15**	42	,,	14	,,	**14**
13	,,	21	,,	**21**	43	,,	20	,,	**20**
14	,,	27	,,	**27**	44	,,	26	,,	**26**
15	Sep.	2	**Sep.**	**3**	45	Mar.	4	**Mar.**	**4**
16	,,	8	,,	**9**	46	,,	10	,,	**10**
17	,,	14	,,	**15**	47	,,	16	,,	**16**
18	,,	21	,,	**21**	48	,,	22	,,	**22**
19	,,	27	,,	**27**	49	,,	28	,,	**28**
20	Oct.	3	**Oct.**	**3**	50	Apr.	3	**Apr.**	**3**
21	,,	9	,,	**9**	51	,,	9	,,	**9**
22	,,	15	,,	**15**	52	,,	15	,,	**15**
23	,,	21	,,	**21**	53	,,	21	,,	**21**
24	,,	27	,,	**27**	54	,,	28	,,	**27**
25	Nov.	2	**Nov.**	**3**	55	May	4	**May**	**4**
26	,,	8	,,	**9**	56	,,	10	,,	**10**
27	,,	14	,,	**15**	57	,,	16	,,	**16**
28	,,	20	,,	**21**	58	,,	22	,,	**22**
29	,,	26	,,	**27**	59	,,	28	,,	**28**
30	Dec.	3	**Dec.**	**3**	60	June	3	**June**	**3**

Finally, all the A.D.'s measuring to a year or to consecutive years of life may be arranged chronologically for comparative study.

PART II

SECONDARY DIRECTIONS

LESSON VII—GENERAL PRINCIPLES

60. Secondary Directions—Secondary Directions rest upon the phenomenon of the anti-clockwise annual motions of bodies in the heavens, due to the orbital revolution of the planets round the Sun, and of Moon round the Earth. In consequence, celestial bodies appear to us to be moving anti-clockwise in the heavens, each at its own rate of daily annual motion, but not at the rate of its apparent diurnal clockwise motion as in the primary directions. Therefore, bodies are dislocated from their zodiacal positions at birth, and are brought to occupy new zodiacal positions. The new zodiacal positions occupied by bodies and angles after every 24 hours from birth are known as their **progressed positions** on the corresponding **progressed dates.** Bodies at their progressed positions are termed **progressed bodies,** while bodies at their birth positions are termed **radical bodies.** Thus owing to their annual motions, bodies are progressed and are brought to new zodiacal aspects (i) to the zodiacal positions of all angles and radical bodies including themselves, and (ii) to the zodiacal positions of all angles and other progressed bodies that are slower in their annual motions than themselves (see Mathematical Astrology, Article 107). Hence, two classes of secondary directions are recognised, (i) those of the Progressed to the Radicals, and (ii) those of the Progressed to the other Progressed. Bodies have each their own daily rate of annual motion, which is about a few minutes of arc in the cases of Jupiter, Saturn, Uranus and Neptune, about one degree or over in the cases of Mars, Sun, Venus and Mercury, and about 11 to 15 degrees in the case of Moon. In the case of the angles, their daily acceleration is only about one degree. Angles have no daily annual motions of their own, as erroneously held (see Article 80). What is regarded as such is nothing but the excess after completing a full circle of 360 ecliptic degrees due to apparent diurnal rotation. So secondary directions as compared with primary directions, are all slowly formed and slowly dissolved. But among themselves, those of the Moon are quicker than those of the rest, and those of ☉, ☿, ♀, ♂ and the Angles slower than that of the Moon but quicker than those of ♃, ♄, ♅ and ♆. The arc moved by each body in one day, is made to measure to one year of life. Therefore, all secondary directions that could bear fruit in 90 years of an individual's life, stand completed within 90 days after birth, though like the primary direc-

tions, they are held to bear fruit in later years measured to by the arcs of directions. As secondary directions are slowly formed and dissolved, an error of even half-an-hour in the birth-time would produce in the time measured to only a difference of about a week. Consequently, the moment of birth need not be accurately known, as in the case of the primary directions. Secondary directions are so called, because they are completed second in point of time after birth, as compared with the primary directions. In secondary directions, the aspects as well as the arcs of directions are all measured upon the ecliptic, and are not to all referred to the equator. Therefore, all secondary directions are purely zodiacal, their being no secondary mundane directions. The course of direction in secondary directions is always anti-clockwise. Very rightly, converse secondary directions are not recognised.

61. The Progressed Date corresponding to an Ordinal year of Life—Cardinal numbers are such as 1, 2, 3, 4, 5, 32, and 87, and ordinal numbers are such as 1st., 2nd., 3rd., 4th., 5th., 32nd., and 87th. Since one day measures to one year of life in secondary directions, so to find the directions that will operate during a particular ordinal year in an individual's life, we should cast the horoscopes for the moment of birth on the two ordinal number of days corresponding to the required ordinal year of life and its succeeding one. Ordinal numbers of time relate to current periods, but cardinal numbers of time to expired periods. In secondary directions we are concerned with current periods, so we should adopt the ordinals, and adhere to it to have one system of reckoning. For example, to find the secondary directions which are held to have borne fruit in George V's 35th year, we should find the two ordinal days from birth corresponding to the 35th and the 36th year of his life. They are the 35th and the 36th day counted from the birth-day, taking it as the first. George V was born at 1-18 a.m. on June 3, 1865, so the 35th and the 36th day from birth are July 7 and 8, 1865. So we should cast horoscopes for 1-18 a.m, G.M.T., (see Art. 62) on July 7 and 8, 1865. The secondary directions found to have been completed between the two dates are held to have operated in the 35th year of his life, that is, from June 3, 1909 to June 3, 1910. Again, if we desire to find the secondary directions operating during a period of consecutive years, say, from the 27th to the 55th year in his life, i.e., from June 3, 1891 to June 3, 1919, we should cast horoscopes for 1-18 a.m. G.M.T. (see Art 62) on every day from June 29 to July 27, 1865. The date of an ordinal number of day from birth for whose moment horoscope is cast is termed the **progressed date**, and the horoscope cast the **progressed horoscope.** The ordinal year of life during which directions operate may be termed the **progressed year**. Therefore, we have

Rule XXXV—Date of Birth + the Ordinal number of Days − 1 = the Progressed Date.

When the result, obtained by applying the rule, exceeds the maximum number of days in the calendar month of birth, deduct from it the maximum number of calendar days and take the remainder as the date in the succeeding month; and when the result exceeds the sum of the maximum number of calendar days in the month of birth and also its succeeding one, deduct from it the sum of the maximum numbers of calendar days in the two months, and take the balance as the date in the third month. For example, George V having been born on June 3, 1865, the progressed date for the 70th day from his birth is 3 + 70 − 1 or the 72nd day from June 1, 1865. Since 72 exceeds 61, the sum of the maximum numbers of calendar days in June and July, by 11, the progressed date is August 11, 1865. Also we have

Rule XXXVI—The Calendar year of Birth + the Ordinal number of year − 1 = the Progressed year.

For example, George V having been born on June 3, 1865, the 70th year from his birth is 1865 + 70 − 1 or 1934, that is, from June 3, 1934 to June 3, 1935. A year is made to commence always from the birth date. Conversely, the ordinal number of the year of life of any calendar year **beginning from the date of birth** is found with the aid of

Rule XXXVII—The given Calendar year + 1 − the Calendar year of Birth = the Ordinal number of year from Birth.

For example, the calendar year 1934 beginning from the birth-date, June 3 (of 1934) is 1934 + 1 − 1865 or the 70th year of life. As it has been suggested at the very outset, that all calculations will be illustrated by taking George V's horoscope, let us jot down a few momentous epochs in his life, to calculate all the secondary directions that were operating during the momentous epochs.

1. He was married to Queen Mary (then Princess) on July 6, 1893.
2. He became the Prince of Wales at the end of 1901.
3. He became King George V on May 6, 1910.
4. He ascended the throne on October 22, 1910.

The four events mentioned above transpired in his 29th, 37th, 45th and 46th years. So let us calculate all the secondary directions which operated during the four years. For this purpose, we require also the progressed moments in the succeeding years. So we shall calculate for the 29th, 30th, 37th, 38th, 45th, 46th and 47th days from birth.

Problem 30—Find the Progressed Dates and the Progressed Years in George V's nativity relating to his 29th, 37th, 45th and 46th years of life.

29th day is from 1-18 a.m. on July 1, 1865...29th year is from 1-18 a.m., June 3, 1893.
30th „ „ „ 2, „ ...30th „ „ „ 1894.
37th „ „ „ 9, „ ...37th „ „ „ 1901.
38th „ „ „ 10, „ ...38th „ „ „ 1902.
45th „ „ „ 17, „ ...45th „ „ „ 1909.
46th „ „ „ 18, „ ...46th „ „ „ 1910.
47th „ „ „ 19, „ ...47th „ „ „ 1911.

62. Progressed Moment of Birth—The moment for which progressed horoscopes are cast on every day after birth may be termed the **progressed moment.** It is customary to take the mean-time of birth on every succeeding day after birth and to cast horoscopes. But mean-day is only a conventional affair, whereas apparent day (see Mathematical Astrology, Art. 20) is nature's or Sun's own day. But all ephemerides give the positions and the sidereal time for mean-time only. So in casting birth horoscopes we take the Greenwich mean-time of birth for finding the positions of bodies, and the local mean-time of birth for determining the longitudes of the cusps. And in casting progressed horoscopes for every succeeding day after birth, we should first convert the local mean-time of birth into apparent time by applying to it the equation of time as applicable to mean-time on the date (see Mathematical Astrology, Article 25). Next, we should convert again the apparent time of birth into its equivalent mean-time on every progressed date by applying to it the equation of time as applicable to apparent time, on the progressed date. The equation of time at a moment is determined according to any of the methods described in "Hindu Astrological Calculations," Article 11. It may also be found from Table I which gives the longitudes of the Sun, and the precise equation of time, as applied to apparent time, for every date in 1927. The equations of time for the dates in other years are the same, varying with the longitudes of the Sun. Find it and that for an intermediate moment by Rule of Three. When equation is applied to apparent time, we get the mean-time of the progressed moment of birth. Lastly, the local mean-time of the progressed moment of birth on every progressed date should be converted into its equivalent Greenwich mean-time of birth by applying the correction for longitude expressed in time (see Mathematical Astrology, Article 37). The equation of time as applied to mean-time, required to convert it into apparent time, may be found from Table I by taking the figures with the opposite sign Thus we obtain, a series of local and Greenwich mean-times varying more or less from each other.

Problem 31—Find the Progressed Moments of birth in George V's nativity on the progressed dates of July 1, 2, 9, 10, 17, 18, and 18 of 1865, given that at birth G.M.T. was 1-18 a.m., June 2/3, 1865, that the longitude of the Sun was 72° 26′, and that the longitude in time of the birth-place was 37 sec. W.

The G.M.T. of birth was 1-18 a.m.

The longitude in time of the birth place is 37 sec. west.

The L.M.T. of birth was 1-17-23 a.m.

The longitude of the Sun was 72° 26'.

∴ The Equation of Time, as applicable to mean-time, on the date, was +2 m. 13 s.

∴ The apparent time of birth was 1-17-23+0-2-13, i.e., 1 h. 19 m. 36 s. or 1-20 a.m.

We should now find the local mean-times corresponding to 1-20 a.m. local apparent time on every required progressed date, and then find again the equivalent Greenwich mean-time on every such date.

Prog. Date.	The Sun's Long.	A.T. of Birth.	Eq. of Time as applied to A.T.	L.M.T. of* Prog. moment.	G.M.T. of* Prog. moment.
July 1	99	1-20 a.m.	+3 min.	1-23 a.m.	1-23 a.m.
„ 2	100	„	+4 min.	1-24 a.m.	1-24 a.m.
„ 9	107	„	+5 min.	1-25 a.m.	1-25 a.m.
„ 10	108	„	„	„	„
„ 17	114	„	+6 min.	1-26 a.m.	1-26 a.m.
„ 18	115	„	„	„	„
„ 19	116	„	„	„	„

The local mean-time of birth was 1-18 a.m., and so the difference between it and the mean-times of the progressed moments of birth on the dates, vary from 6 to 9 minutes. But in extreme cases, the difference may amount to nearly 30 minutes. As one day measures to one year of life, a difference of 30 minutes in the progressed moment will produce in the time measured to, a difference of about 7 days in the secondary directions of the Progressed to the Radical, and of about 10 days in the secondary directions of the Progressed bodies to the other Progressed bodies (let alone the progressed angles for the present). It may be argued that since the difference, at its greatest, is very small, and that since time measured to in secondary directions do not clinch the date when the directions bear fruit, we might take the mean-time of birth throughout to facilitate calculations. But scientific precision requires us to go by apparent time in preference to mean-time. Therefore, I shall take the apparent time of birth as the progressed moment and proceed to cast the progressed horoscopes in George V's nativity.

63. Progressed Horoscopes—We have determined the progressed dates in Article 61, and the progressed moments of the mean-time of birth on each progressed date in Article 62. It now remains to cast the progressed horos-

* The local mean-times do not differ from the Greenwich mean-times, when both of them and the equation of time are taken correct to a minute, since London, the birth-place is only 37 seconds west of Greenwich.

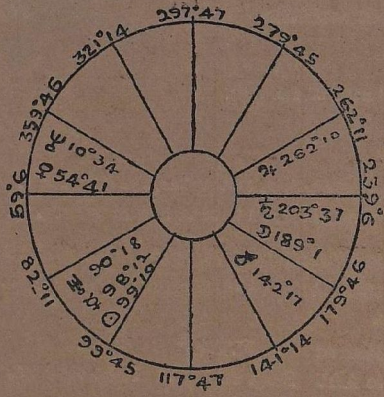


Fig. XIV—George V's Progressed Map for the 29th year, corresponding to the progressed date, 1-23 a.m., G.M.T. July 1, 1865.

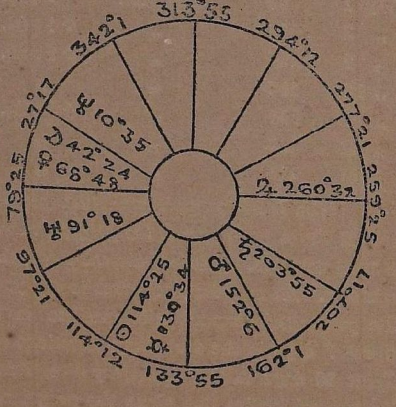


Fig. XV—George V's Progressed Map for the 45th year, corresponding to the progressed date, 1-26 a.m., G.M.T. July 17, 1865.

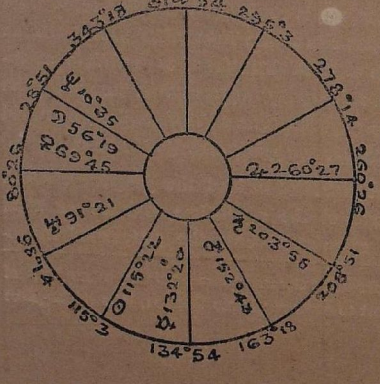


Fig. XVI—George V's Progressed Map for the 46th year, corresponding to the progressed date, 1-26 a.m., G.M.T. July 18, 1865.

Schedule XVII—The Longitudes of Bodies on the Progressed Dates

Prog. Date	☽ Long.	D.M.	☿ Long.	D.M.	☉ Long.	D.M.	♀ Long.	D.M.	♂ Long.	D.M.	♃ Long.	D.M.	♅ Long.	D.M.	♄ Long.	D.M.	♆ Long.	D.M.	Prog. year
1865 July	°	′	°	′	°	′	°	′	°	′	°	′	°	′	°	′	°	′	June 3
1	189	1	11	51	98	12	2	11	99	10	57	54	41	48	142	17	37	262	10	—7	90	18	4	203	37	1	10	34	0	1893
2	200	52	11	54	100	23	2	10	100	7	57	55	29	49	142	54	36	262	3	—7	90	22	3	203	38	1	10	34	0	1894
9	289	28	13	52	115	10	2	1	106	47	58	61	28	53	147	9	37	261	17	—6	90	48	4	203	45	1	10	36	0	1901
10	303	20	14	3	117	11	2	0	107	45	57	62	21	53	147	46	37	261	11	—6	90	52	4	203	46	1	10	36	0	1902
17	42	24	13	55	130	34	1	46	114	25	57	58	48	57	152	6	37	260	32	—5	91	18	3	203	55	1	10	35	0	1909
18	56	19	13	48	132	20	1	46	115	22	58	59	45	57	152	43	37	260	27	—5	91	21	3	203	56	1	10	35	0	1910
19	70	7	13	40	134	6	1	44	116	20	57	70	42	58	153	20	37	260	22	—5	91	24	3	203	57	2	10	35	0	1911
																														To

Schedule XVIII—The Declinations of Bodies on the Progressed Dates

Prog. Date	☾ Decl.	D.M.	☿ Decl.	D.M.	☉ Decl.	D.M.	♀ Decl.	D.M.	♂ Decl.	D.M.	♃ Decl.	D.M.	♅ Decl.	D.M.	♄ Decl.	D.M.	♆ Decl.	D.M.	Prog. year
1865 July	°	′	°	′	°	′	′	°	′	′	°	′	′	°	′	′	°	′	′	June 3
1	5	S 2	+3	36	24	N 24	− 3	23	N 8	− 4	15	N 28	+10	15	N 13	—12	22	S 51	0	23	40	0	6	S 48	+1	2	N 47	0	1893
2	8	38	+3	17	24	21	− 6	23	4	− 5	15	38	+11	15	1	—13	22	51	0	23	40	0	6	49	+0	2	47	0	1894
9	17	0	−2	31	22	51	−21	22	24	− 7	16	55	+11	13	32	—13	22	49	0	23	40	0	6	53	+1	2	47	0	1901
10	14	29	−3	23	22	30	−24	22	17	− 8	17	6	+11	13	19	—13	22	49	−1	23	40	0	6	54	+0	2	47	0	1902
17	14	6	+2	37	19	11	−34	21	14	−10	18	22	+10	11	44	—14	22	47	0	23	40	0	6	59	+1	2	47	0	1909
18	16	43	+1	39	18	37	−34	21	4	−10	18	32	+10	11	30	—13	22	47	0	23	40	0	7	0	+1	2	47	0	1910
19	18	22	+0	33	18	3	−35	20	54	−11	18	42	+ 9	11	17	—14	22	47	−1	23	40	0	7	1	+1	2	47	0	1911
																													To

copes in George V's nativity for the mean-times of birth on the several progressed dates. They are cast precisely like the horoscope of birth. But it is unnecessary to erect maps for all the horoscopes, as it will do to prepare a schedule of the longitudes and declinations of every body on each progressed date.

Problem 32—Find the longitudes and the daily motions of the two angles, the seven planets and the two luminaries at the Greenwich mean-times of birth corresponding to 1·20 a.m., apparent time, on the seven progressed dates of July 1, 2, 9, 10, 17, 18 and 19, 1865.

See Schedule XVII, for the solution of the problem.

Problem 33—Find the declinations and the daily motions in declination of the two angles, the seven planets and the two luminaries at the Greenwich mean-times corresponding to 1·20 a.m., apparent time, on the seven progressed dates of July 1, 2, 9, 10, 17, 18 and 19, 1865.

See Schedule XVIII, for the solution of the problem.

LESSON VIII

SECONDARY DIRECTIONS

TO THE RADICALS

64. Secondary Directions of the Progressed to the Radicals—In this class of secondary directions the progressed body is the directed body, and the radical body is the stationary position. But the progressed angles cannot be directed, though bodies can be directed to them; for the angles are fixed mundane points with no progression of their own. An aspect is measured, as usual, either way from the radical body. As there are nine progressed bodies and eleven radicals (nine bodies and two angles), the possible number of sets of directions, each with the same progressed and radical body, is ninety-nine. The aspects directed to may be any one or more of the twelve aspects, including the parallel. The arc of direction is the angular distance from the progressed body to the limit where the aspect falls. Time is measured at the rate of one year for every one day of progression. In the notation of directions, the small letter "p" standing for 'progressed' is inserted after the symbol of the progressed body, and the small letter "r" standing for 'radical' after that of the radical body, e.g., ☉ p △ ☉ r.

65. Determination of the Arc of Direction—To find all the secondary directions between all the progressed bodies and the radicals, first prepare two schedules, (i) of the longitudes with the daily motions of each progressed body on every progressed date in the required period (see Schedule XVII), and (ii) of the limits of the full cycle of the eleven aspects measured from each radical (see Schedule XIX). Next, take the series of longitudes of a progressed body as given in Schedule XVII, and see which, if any, of the aspect extents as given in Schedule XIX, falls within the whole range of the longitudes of the progressed body, during the period chosen. If any aspect so falls, note (1) the progressed body, (2) the daily motion of the body, (3) the calendar year measured to by the progressed date corresponding to the longitude of the progressed body, (4) the symbol of the radical, (5) the anti-clockwise distance from each progressed body to the limit, and (6) the symbol of the aspect. The daily motion on a date, of a progressed body is the difference between its longitude on the date and that on the next succeeding date. For example, the daily motion on the sixteenth of a month is the difference between the longitude on the 16th and that on the 17th. The arc of direction is ftem (4), i.e., the anti-clockwise distance from the progressed body to the limit. For example, in the illustrated nativity, taking the progressed

Schedule XIX—Limits of the Aspects to the Radicals.

Asp.	♆		♀		☿		☉		♅		♂		☽		♄		♃		M.C.		Ascend.	
Increasing																						
☌	10°	10′	39°	39′	48°	29′	72°	26′	88°	37′	125°	35′	181°	3′	204°	6′	265°	40′	270°	47′	2°	4′
⚺	40	10	69	39	78	29	102	26	118	37	155	35	211	3	234	6	295	40	300	47	32	4
∠	55	10	84	36	93	29	117	26	133	37	170	35	226	3	249	6	310	40	315	47	47	4
⚹	70	10	99	39	108	29	132	26	148	37	185	35	241	3	264	6	325	40	330	47	62	4
Q	82	10	111	39	120	29	144	26	160	37	197	35	253	3	276	6	337	40	342	47	74	4
□	100	10	129	39	138	29	162	26	178	37	215	35	271	3	294	6	355	40	0	47	92	4
△	130	10	159	39	168	29	192	26	208	37	245	35	301	3	324	6	25	40	30	47	122	4
⚻	145	10	174	39	183	29	207	26	223	37	260	35	316	3	339	6	40	40	45	47	137	4
Bq	154	10	183	39	192	29	216	26	232	37	269	35	325	3	348	6	49	40	54	47	146	4
⚼	160	10	189	39	198	29	222	26	238	37	275	35	331	3	354	6	55	40	60	47	152	4
☍	190	10	219	39	228	29	252	26	268	37	305	35	1	3	24	6	85	40	90	47	182	4
Decreasing																						
⚼	220	10	249	39	258	29	282	26	298	37	335	35	31	3	54	6	115	40	120	47	212	4
Bq	226	10	255	39	264	29	288	26	304	37	341	35	37	3	60	6	121	40	126	47	218	4
⚻	235	10	264	39	273	29	297	26	313	37	350	35	46	3	69	6	130	40	135	47	227	4
△	250	10	279	39	288	29	312	26	328	37	5	35	61	3	84	6	145	40	150	47	242	4
□	280	10	309	39	318	29	342	26	358	37	35	35	91	3	114	6	175	40	180	47	272	4
Q	298	10	327	39	336	29	0	26	16	37	53	35	109	3	132	6	193	40	198	47	290	4
⚹	310	10	339	39	348	29	12	26	28	37	65	35	121	3	144	6	205	40	210	47	302	4
∠	325	10	354	39	3	29	27	26	43	37	80	35	136	3	159	6	220	40	225	47	317	4
⚺	340	10	9	39	18	29	42	26	58	37	95	35	151	3	174	6	235	40	240	47	332	4

Mercury on July 17, 1865, and the radical Saturn, we find that the longitude of progressed Mercury was 130° 34′ with the daily motion of + 1° 46′ on the day (see Schedule XVII), and that 132° 6′, the limit of the decreasing quintile aspect of Mercury to radical Saturn (see Schedule XIX) falls between 130° 34′ and 132° 20′, the longitudes of ☿ on July 17 and 18, 1865. So we note the secondary direction, ☿ p Q ♄ r, and its A.D. as 132° 6′ − 130° 34′, i.e., 1° 32′.

66. The Time measured to by an arc of direction—In the above example, the daily motion of the progressed body on the day was 1° 46′, and the calendar year measured to by the progressed date, July 17, 1865, was the year commencing from June 3, 1909. As one day measures to one year of life, so the daily motion of the progressed body has to be spread over a whole year. The arc of direction which is a fraction of the daily motion, will, as such, measure to a proportionate part of a year. Therefore, we have the proportion :—

The daily motion : A.D. : : twelve months : the number of months measured to. So the number of months measured to is obtained by multiplying the arc of direction by 12, and dividing the product by the daily motion, or what is the same, by dividing the arc of direction by one-twelfth of the daily motion. We shall adopt the latter method as we will be spared the multiplication, and will have a smaller divisor to operate with. In the above example, the number of months measured to will be 1° 32′ or 92′ × 1/12 of 1° 46′, i.e., 92 ÷ 8·83 = 10·42 months. To reach the time measured to, with the number of months thus obtained, count onwards from the date of birth in the corresponding progressed year. It will do, if the time measured to is reckoned correct to the corresponding ordinal calendar month, since secondary directions do not clinch the events correct to days. For example, if the horoscope under illustration for the forty-fifth day, July 17, 1865, is taken, the date will measure to the eleventh month in the year beginning from June 3, 1909. The eleventh month from June 3, 1909, is April, 1910. Therefore, the time measured to by the secondary direction ☿ p Q ♄ r is April, 1910, and we note as follows :—

☿ p Q ♄ r.....April 1910.

Problem 34—Find all the secondary directions in George V's nativity of the progressed Sun to all the radicals, which operated during the four years ,June 3, 1893 to 4, 1901 to 2, 1909 to 1910, and 1910 to 1911.

The longitudes of the progressed Sun ranged during the 4 days July 1-2, 9-10, 17-18, and 18-19 from 99° 10′ to 100° 7′, 106° 47 to 107° 45, 114° 25′ to 115° 22′, and 115° 22′ to 116° 20′.

Let us take the radicals, one by one, in their order in the nativity, beginning, for the sake of convenience, from the one with numerically the smallest longitude.

(1) To the Radical Neptune. Since no limit given in Schedule XIX falls within the four ranges of the longitudes of the Sun, so there will be no direction of the Sun to any aspect of Neptune.

(2) To the Radical Venus. The limit, 99° 39′, ✶ to the radical Venus, falls between 99° 10′ and 106° 47′.

∴ The A.D. = 99° 39′ − 99° 10′ = 29′.

∵ One-twelfth of the daily motion of ☉ was 57 ÷ 12, i.e., 4·75.

∴ The month measured to was 29 ÷ 4·75, i.e., 6·1 months, or the 7th month from June, 1893. So we say, ☉p ✶ ♀r...December, 1893.

(3) To the Radical Mercury...Nil.

(4) To the Radical Sun...Nil.

(5) To the Radical Uranus...Nil.

(6) To the Radical Mars...Nil.

(7) To the Radical Moon...Nil.

(8) To the Radical Saturn...Nil.

(9) To the Radical Jupiter.

The limit, 115° 40′, ☍ to the radical Jupiter, falls between 115° 22′ and 116° 20′.

∴ The A.D. = 115° 40 − 115° 22 = 0° 18′.

∵ One-twelfth of the daily motion of ☉ on the day was 58′ ÷ 12 = 4·83′.

∴ The month measured to was 18 ÷ 4·83, i.e., 3·7 months or the 4th month from June 1910. So we say, ☉p ☍ ♃r...September, 1910.

(10) To the Radical Meridian...Nil.

(11) To the Radical Ascendant...Nil.

Problem 35—Find all the secondary directions in George V's nativity of the other eight progressed bodies to aspects of the eleven radicals during the four years, June 3, 1893 to 4, 1901 to 2, 1909 to 10 and 1910 to 1911.

(i) Progressed Neptune to the Radicals...Nil.

(ii) Progressed Venus to the Radicals.

♀p ✶	Asc.r	36′ ÷ 4·4′	Feb. 1902.	♀p ☌	♀r	51′ ÷ 4·75′,	Apr. 1910.
♀p ∠	♆r	29 ÷ 4·0,	Jan. 1894.	♀p □	♄r	18 ÷ 4·75,	Sep. 1909.
♀p ✶	♆r	25 ÷ 4·7,	Nov. 1910.	♀p Bq.M.C.r		6 ÷ 4·0.	June 1893.

(iii) Progressed Mercury to the Radicals.

☿p ✶	♀r	1° 27′ ÷ 11′,	Feb. 1894.	☿p ☌	♄r	1° 32′ ÷ 8·8′,	Apr. 1910.
☿p ∠	☉r	0 15 ÷ 10,	July 1902.	☿p ☍	♃r	0 30 ÷ 10,	Sep. 1901.
☿p ✶	☉r	0 6 ÷ 8·8,	June 1910.	☿p □	♃r	0 6 ÷ 8·8,	June 1909.
☿p ∠	♅r	1 17 ÷ 8·8,	Feb. 1911.				

(iv) Progressed Uranus to the Radicals.

♅p ☌ M.C.r 3 ÷ 0·33 March 1901.

(v) Progressed Mars to the Radicals.

♂p ☍ Asc.r 35 ÷ 3·1, May 1909.

(vi) Progressed Moon to the Radicals.

(1)	☽ p ☌ Asc.r	0° 36′÷70′,	June 1901.	☽ p ✶ Asc.r	5° 45÷70′,	Nov. 1910.
	☽ p ✶ Asc.r	12 36÷70	May 1902.	☽ p ∠ Asc.r	4 40÷70,	Oct. 1909.
(2)	☽ p ♂ ♆r	1 9÷60,	July 1893.	☽ p ∠ ♆r	12 46÷70,	Apr. 1910.
	☽ p ☌ ♆r	8 42÷70,	Jan. 1902.	☽ p ✶ ♆r	0 3÷69,	June 1911.
	☽ p ⚻ ♆r	11 48÷70,	Apr. 1909.			
(3)	☽ p ☍ ♀r	0 38÷60,	June 1893.	☽ p ⚻ ♀r	13 20÷69,	May 1911.
(4)	☽ p Bq. ♅r	3 28÷60,	Sep. 1893.	☽ p △ ♅r	12 36÷70,	May 1901.
	☽ p ☍ ♅r	9 28÷60,	Mar. 1894.	☽ p ♂ ♅r	6 5÷70,	Nov. 1909.
(5)	☽ p △ ☉r	3 25÷60,	Sep. 1893.	☽ p ☐ ☉r	7 53÷70,	Jan. 1902.
	☽ p Bq. ☉r	12 33÷68,	May 1901.			
(6)	☽ p ☍ ♇r	9 9÷70,	Mar. 1902.	☽ p ∠ ♇r	1 13÷70,	July 1909.
	☽ p Bq. ♇r	1 17÷70,	July 1902.	☽ p ⚻ ♇r	2 18÷69,	Aug. 1910.
(7)	☽ p ☌ ♂r	8 34÷60,	Feb. 1894.	☽ p ☌ ♂r	11 11÷70,	Mar. 1910.
	☽ p ♂ ♂r	2 15÷70,	July 1902.	☽ p ✶ ♂r	9 16÷69.	Jan. 1911.
(8)	☽ p △ ☽r	11 35÷70,	Apr. 1902.	☽ p △ ☽r	4 44÷69,	Oct. 1910.
	☽ p ☐ ☽r	3 39÷70,	Sep. 1909.			
(9)	☽ p □ ♄r	4 38÷70,	Oct. 1901.	☽ p Bq ♄r	3 47÷69,	Sep. 1910.
	☽ p ☍ ♄r	11 42÷70,	Apr. 1910.	☽ p ☐ ♄r	12 47÷69,	Apr. 1911.
(10)	☽ p ☌ ♃r	4 39÷60,	Oct. 1893.	☽ p Bq ♃r	7 16÷70,	Dec. 1909.
	☽ p ⚻ ♃r	6 12÷70,	July 1901.	☽ p ☍ ♃r	13 16÷70,	May 1910.
(11)	☽ p ☌ M.C.r	9 46÷60,	Mar. 1894.	☽ p Bq M.C.r	12 23÷70,	Apr. 1910.
	☽ p ☐ M.C.r	3 23÷70,	Aug. 1909.	☽ p ☍ M.C.r	4 28÷69,	Sep. 1910.

(vii) Progressed Saturn to the Radicals...Nil.

(viii) Progressed Jupiter to the Radicals...Nil.

67. Secondary Directions to the Parallels of the Radicals—The arc of direction is determined in precisely the same manner as in secondary directions to the aspects of the radicals. To find all the parallels between all the progressed bodies and the radicals, first prepare two schedules, (i) of the declinations with the daily motions in declination of each progressed body on every progressed date during the required period (Schedule (XVIII), and (ii) the declinations of the radicals (see Schedule XX). Next, take the series of declinations of the progressed body, and note all parallels which fall between the range of the declinations of each radical taken in succession.* If any, note (1) the progressed body, (2) the daily motion in declination of the progressed body on the day, (3) the calendar year measured to by the progressed date corresponding to the declination of the progressed body, (4) the symbol of the radical, (5) the difference

* A progressed body, when the range of its declinations is very wide as in the case of ☽, may be in parallel to the same radical more than once (see Fig. XVII).

between the declination of the radical and the declination of the progressed body just after which the declination of the radical falls, and (6) the symbol of parallel. The daily motion in declination of a progressed body on a date is the difference between its declination on the date and that on the next succeeding date. The arc of direction is the difference between the declination of the radical and that of the progressed body just after which the declination of the radical falls. The number of months measured to by the arc of direction is found just in the same way as is described in Art. 66. In Schedule XX below, the radicals are arranged in the numerical order of their declinations to facilitate the spotting of all the parallels.

Schedule XX—Declinations of the Radicals.

Asc.	☽	♆	♄	☿	♅	♂	☉	♃	M.C.	♇
° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0 N 49	2 S 39	2 N 40	6 S 51	13 N 17	14 N 10	20 N 17	22 N 18	22 S 56	23 S 27	23 N 39

Problem 36—Find in George V's nativity all the secondary directions of the progressed Sun to the parallel of all the radicals which operated during the four years June 3, 1893 to 4, 1901 to 2, 1909 to 10, and 1910 to 11.

The ranges of declinations of the progressed sun during the 4 progressed dates are from 22° 8′ to 23° 4′, 22° 24′ to 22° 17′, 21° 14′ to 21° 6′, and 21° 6′ to 20° 54′.

(i) To the Radical Neptune...Nil.

(ii) To the Radical Venus...Nil.

(iii) To the Radical Mercury...Nil.

(iv) To the Radical Sun. Its declination is 22° 18′. It falls just after 22° 24′, the declination of the progressed Sun on July 9, 1865, which corresponds to June 3, 1901. The daily motion was 7′. ∴ The month measured to was 6 ÷ 0·6, i.e., 10, or the 11th month from June, 1909.

So we have ☉p ∥ ☉r...April 1902.

(v) To the Radical Uranus...Nil.

(vi) To the Radical Mars...Nil.

(vii) To the Radical Moon...Nil.

(viii) To the Radical Saturn...Nil.

(ix) To the Radical Jupiter...Nil.

(x) To the Radical M.C....Nil.

(xi) To the Radical Asc....Nil.

Problem 37—Find all the secondary directions in George V's nativity of the progressed bodies other than the Sun to the parallel of the eleven radicals which operated during the four years, June 3, 1893 to 4, 1901 to 2, 1909 to 10, and 1910 to 1911.

(i) Progressed Neptune to the Radicals...Nil.

(ii) Progressed Venus to the Radicals...Nil.

(iii) Progressed Mercury to the Radicals...Nil.

(iv) Progressed Uranus to the Radicals ...Nil.

(v) Progressed Mars to the Radicals. ♂p ∥ ☿r 1′÷1′1′ June 1902.

(vi) Progressed Moon to the Radicals.

☽p ∥ ♄r 109÷18′ Dec. 1893. ☽p ∥ ☿r 5′÷13′ June 1909.

☽p ∥ ☿r 18÷17 July 1902.

(vii) Progressed Saturn to the Radicals...Nil.

(viii) Progressed Jupiter to the Radicals...Nil.

LESSON IX

SECONDARY DIRECTIONS

TO THE PROGRESSED

68. Secondary Directions of the Progressed to the other Progressed—In this class of secondary directions both the bodies are moving. So, the swifter of the two is taken as the directed body, and the slower as the body directed to, there being no stationary position. A progressed body can be directed to another slower than itself but not to itself nor to one faster than itself (see Mathematical Astrology, Art. 107). The progressed angles can neither be directed nor directed to (Art. 71). At times it may happen that the swifter of two bodies becomes, after a period, slower than the other. In such a case, the two bodies exchange their original relations—the originally swifter one now being the slower becomes the body directed to, and the originally slower one now being the swifter becomes the directed body. For example, in George V's nativity, the Sun is faster in its daily motion than Venus from June 29, 1865 to July 18, 1865, and Venus is faster than the Sun from July 19, 1865. So from June 29, 1865, the Sun is the directed body of the two, and from July 19, 1865, Venus is the directed body of the two. Hence, the Sun could be directed to Venus only till July 18, 1865, and Venus could be directed to the Sun only from July 19, 1865, but not the other way. There are nine progressed bodies, and as a progressed body could be directed only to another progressed body slower than itself, the sets of possible secondary directions, each with the same directed body and the same body directed to are $8+7+6+5+4+3+2+1$ or 36 in all. In each set of directions, the aspect directed to may be one or more of the twelve aspects including the parallel. The aspects are measured, as usual, either way from the body directed to. The arc is determined differently and the time measured to is also calculated in a slightly different manner, though here too one day measures to one year. In the notation of directions, the small letter "p" is placed after both the bodies, e.g., ☉p △ ☽p.

69. Determination of the Arc of Direction—To find all the secondary directions between each of the nine progressed bodies and all others slower than itself, prepare a statement of the longitudes and daily motions of each progressed body on every progressed date during the required period (see Schedule XVII). Next, take the longitude of a progressed body on the very first progressed date, and the longitude of every other progressed body moving slower than itself, on the same date. Now find the **shorter distance** between the progressed body and

every other slower progressed body, as they stood on the first date. This is obtained by deducting the numerically smaller longitude from the greater, and rectifying it, in case it exceeds 180°, by subtracting it from 360°. Next, take the longitudes of the same set of two bodies on the next succeeding progressed date, and again find the shorter distance between them in the same way, rectifying it, if necessary. Similarly, find the shorter distance between each pair on the consecutive progressed dates included in the required period. Now we have a series of shorter distances between the same pairs of progressed bodies corresponding to every consecutive progressed date. The shorter distances between the same two bodies on consecutive progressed dates, may be numerically increasing or decreasing. In consequence, the extents of the aspects between two sets of bodies may be increasing or decreasing. Now, take in succession every two consecutive shorter distances between the same two bodies, and see if the extent of any aspect lies between them. If so, note (1) the swifter of the two as the directed body, (2) the slower or the other progressed body, (3) the difference between the aspect extent and the first of the two consecutive shorter distances, (4) the difference between the two consecutive shorter distances, (5) the symbol of the aspect whose extent intervenes between the two consecutive shorter distances, and (6) the calendar year measured to by the first of the two consecutive progressed dates. The arc of direction is the third item, that is, the difference between the aspect extent and the first of two consecutive shorter distances between which the aspect extent lies. If no aspect extent intervenes between two consecutive shorter distances, then no direction is possible between the two bodies concerned on the day under investigation, and so none measure to the corresponding progressed year. In determining the aspect extent intervening between two consecutive shorter distances between the same two bodies, and more especially in determining the difference between two consecutive shorter distances between the same two bodies, one cannot be too careful when the two bodies approach their conjunction or opposition. As, at these two points, the shorter distances which have been decreasing or increasing till then cease to do so, and begin to become contrariwise. In the result, the real numerical difference between the consecutive shorter distances covering the conjunctional or oppositional point is much greater than what it appears to be. For example, in George V's nativity, the shorter distances between ☽p and ♆p was 174° 18′ on July 9, 1865, and 173° 51′ on July 10, 1865. The difference between the two consecutive shorter distances between the two bodies on July 9, 1865 and July 10, 1865 appears to be 174° 18′ − 173° 51′, i.e., 0° 27′, and the next higher aspect extent of 180° or the opposition does not appear to lie between the two shorter distances. But in reality, during the 24 hours between the moments of birth on July 9, 1865 and July 10, 1865, the shorter distance between the two bodies has risen from 174° 18′ to 180° 0′ and then

has fallen to 173° 51′ due to rectification. So the difference between the shorter distances is (180° − 174° 18′) + (180° − 173° 51′), i.e., 11° 51′ but not 0° 27′ (see Problem 38). Again, the shorter distance between the same two bodies, on July 24, 1865, was 6° 2′, and that on July 25, 1865, was 4° 55. So, the difference between the two consecutive shorter distances appears to be 6° 2′ − 4° 55′, i.e., 1° 7′, but it is really 6° 2′ + 4°55′, i.e., 10° 57.′

70. Time measured to—As one day measures to one year, so the difference between two consecutive shorter distances has to be spread over a whole year Therefore, we have the proportion :—

Difference between S.D.'s : A.D. : : 12 months : month measured to.

For the reason stated in Article 66, the number of months measured to by an arc of direction is found by dividing the arc by one-twelfth of the difference between the two consecutive shorter distances. To reach the time measured to with the number of months thus obtained, count onwards from the date of birth in the corresponding progressed year. As before, it will do if the time measured to is reckoned correct to a calendar month.

Problem 38.—Find in George V's nativity, all the secondary directions of progressed Moon to aspects of all the other eight progressed bodies, which operated during the four years, June 3, 1893 to 4, 1901 to 2, 1909 to 10, and 1910 to 1911.

For the solution of the problem see the statements on Pages 92 and 93.

Problem 39—Find in George V's nativity all the secondary directions of all the progressed bodies other than Moon, to the aspects of all the other seven progressed bodies, which operated during the four years from June 3, 1893 to 4. 1901 to 2, 1909 to 10, and 1910 to 1911.

Progressed Neptune to the other Progressed...Nil.

Progressed Venus to the other Progressed

☽p ☐ ♄p 7÷56 July 1909. ☽p ✶ ♆p 50÷57 Apr. 1911.

Progressed Mercury to the other Progressed.

☿p ☌ ☉p 58÷74 Mar. 1894. ☿p △ ♆p 1÷106 June 1909.

☿p Bq ♃p 0÷0 June 1902. ☿p ☌ ♄p 81÷105 Apr. 1910.

Progressed Sun to the other Progressed.

☉p Bq ♃p 2÷62 June 1911.

Progressed Uranus to the other Progressed...Nil.

Progressed Mars to the other Progressed...Nil.

Progressed Jupiter to the other Progressed...Nil.

71. Secondary Directions to the Parallels of the other Progressed—Here too, it is only the swifter body in its daily motion in declination that could

be directed to another body. The arc is determined in precisely the same manner as in directions to aspects of the other progressed (Art. 68), except that the aspect extent of a parallel is, so to say, 0° in declination. The daily motions in declination of a progressed body varies very widely. To determine the arc of direction take the full series of declinations of a body on consecutive progressed dates during the required period, and take the declinations on the dates of one body in succession among the remaining eight progressed bodies, and see between what two dates the declinations of the two bodies coincide, having no regard to the names of the declinations. This is done by comparing the declination of each of the two bodies on the same date, to ascertain if they tend to meet or cross each other. They will tend to meet when their declinations are alike increasing or decreasing numerically: and will tend to cross when one increases while the other decreases. Whether they meet or cross, note the two consecutive progressed dates between which they meet or cross, and find the difference between their declinations on the first of the two dates. This is the arc of direction. The number of months measured to by the arc of direction, is found when the declinations of both bodies increase or decrease alike, by dividing the A.D. by one-twelfth of the difference between their daily motions in declination on the first date. And when the declination of one increases numerically, while that of the other decreases, by dividing the A.D. by one-twelfth of the sum of their daily motions in declination on the first date. Finally, take the body moving faster in declination as the directed body. Here too, one ought to be careful in finding the daily motions in declination of a body when it changes its course from north to south or south to north. For example, the declination of Moon on July 13, 1865 was 2 S 55, and on July 14, 1865, 2 N 2. So the daily motion in declination of Moon on the day was not 0° 53′ but 2° 55′ + 2° 2′, i.e., 4° 57′. For the ranges of declinations of the nine bodies on the consecutive progressed dates, see Schedule XVIII.

Problem 40—Find in George V's nativity all the secondary directions of each of the progressed bodies to the parallel of all the other progressed during the four years from June 3, 1893 to 4, 1901 to 2, and 1909 to 10, and 1910 to 11.

Progressed Neptune to the parallel of all the other Progressed...Nil.

Progressed Venus to the parallel of all the other Progressed...Nil.

Progressed Mercury to the parallel of all the other Progressed.

☿p ∥ ♀p 5÷44 July 1910. ☿p ∥ ♃p 2÷21 July 1901.

Progressed Sun to the parallel of the other Progressed...Nil.

Progressed Saturn to the parallel of all the other Progressed...Nil.

Progressed Mars and Jupiter to the parallel of all the other Progressed...Nil

Progressed Moon to the parallel of all the other Progressed.

☽p ∥ ♄p 106÷215 Dec. 1893. ☽p ∥ ☿p 114÷133 Apr. 1911.

☽p ∥ ♀p 5÷162 June 1901.

Shorter distances from ☽ p to

Prog. Date	☿ p	☉ p	♀ p	♂ p	♃ p	♅ p	♄ p	♆ p	Prog. year	
July 1,	189 1	189 1	189 1	189 1	262 10	189 1	203 37	189 1	June 3	
1865	98 12	99 10	54 41	142 17	189 1	90 18	189 1	10 34	1893	
	90 49	89 51	134 20	46 44	73 9	98 43	14 36	178 27		☽ p □ ☉ p June 1893
		□ 9÷654	☐ 40 ÷663		Q 69÷718			♂ 93÷711		☽ p ☐ ♀ p June 1893
			Bq 580÷663							☽ p Q ♃ p July 1893
										☽ p ♂ ♆ p July 1893
										☽ p Bq ♀ p Apr. 1894
July 2,	200 52	200 52	200 52	200 52	262 3	200 52	203 38	200 52	June 3,	
1865	100 23	100 7	55 29	142 54	200 52	90 22	200 52	10 34	1894	
	100 29	100 45	145 23	57 58	61 11	110 30	2 46	169 42		
July 9,	289 28	289 28	289 28	289 28	289 28	289 28	289 28	289 28	June 3,	
1865	115 10	106 47	61 28	147 9	261 17	90 48	203 45	10 36	1901	
	174 18	177 19	132 0	142 19	28 11	161 20	85 43	81 8		☽ p Bq ♂ p July 1901
										☽ p ☌ ♃ p July 1901
										☽ p □ ♄ p Sep. 1901
										☽ p ♂ ☿ p Nov. 1901
										☽ p ☍ ♂ p Jan. 1902
	♂ 342÷711		△ 720÷779	Bq 101÷795	∠ 109÷838	☍ 680÷808	□ 257÷831	Q 548÷832		☽ p Q ♆ p Jan. 1902
				☍ 461÷795						☽ p ☍ ♅ p Mar. 1902
										☽ p △ ♀ p May 1902
July 10	303 20	303 20	303 20	303 20	303 20	303 20	303 20	303 20	June 3.	
1865	117 11	107 45	62 21	147 46	261 11	90 52	203 46	10 36	1902	
	173 51	164 25	119 1	155 34	42 9	147 32	99 34	67 16		

Shorter distances from ☽ p to

Prog. Date	☿ p	☉ p	♀ p	♂ p	♃ p	♅ p	♄ p	♆ p	Prog. year	
July 17	130 34	114 25	68 48	152 6	260 32	91 18	203 55	42 24	June 3	
1865	42 24	42 24	42 24	42 24	42 24	42 24	42 24	10 35	1909	
	88 10	72 1	26 24	109 42	141 52	48 54	161 31	31 49		☽ p ☌ ☉ p June 1909 ☽ p Bq ♃ p July 1909 ☽ p ∠ ♅ p Sep 1909 ☽ p ☍ ♃ p Jan 1910 ☽ p ☍ ♄ p May 1910 ☽ p ∠ ♆ p May 1910 ☽ p ✶ ☉ p May 1910
		☌ 1÷778 ✶721÷778		Bq128÷846 ☍483÷840	∠234÷832		∠791÷835			
July 18	132 20	115 22	69 45	152 43	260 27	91 21	203 56	56 19	June 3,	
1865	56 19	56 19	56 19	56 19	56 19	56 19	56 19	10 35	1910	
	76 1	59 3	13 26	96 24	155 52	35 2	147 37	45 44		
July 18	132 20	115 22	69 45	152 43	260 27	91 21	203 56	56 19	June 3	
1865	56 19	56 19	56 19	56 19	56 19	56 19	56 19	10 35	1910	
	76 1	59 3	13 26	96 24	155 52	35 2	147 37	45 44		☽ p Bq ♄ p Sep 1910 ☽ p ☌ ☿ p Oct 1910 ☽ p ☍ ♅ p Oct 1910 ☽ p □ ♂ p Nov 1910 ☽ p ☐ ♄ p Nov 1911
	☌ 241÷722			□384÷791		☍302÷825	Bq 217÷827 757÷827			
July 19	134 6	116 20	70 42	153 20	260 22	91 24	203 57	70 7	June 3,	
1865	70 7	70 7	70 7	70 7	70 7	70 7	70 7	10 35	1911	
	63 59	46 13	0 35	83 13	169 45	21 17	133 50	59 32		

72. The Graph Method—When the reader finds it rather embarassing to find all the secondary directions to parallel, he should draw a graph of the range of declinations of each body, marking the progressed dates on one side and the degrees of the declination on the other side of the graph. In the graph only the numerical variation in the declinations of each body should be shown, ignoring the names of the declinations. Every crossing of the graph lines of two bodies will show the date and the degree at parallel. Such a graph in George V's nativity for the 28 years from June 3, 1891 to June 3, 1919 would be as sketched below, in which the 25 parallels occuring during the period are shown as 25 circles, indicating the crossings.

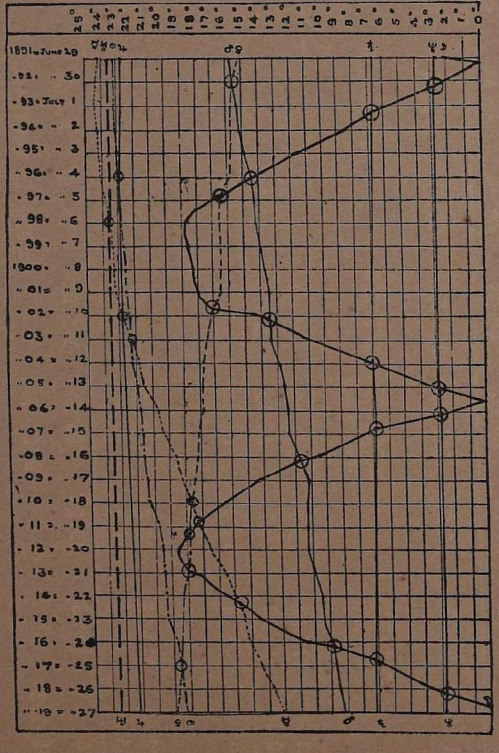


Fig. XVII—The graph showing the curves traced by the declinations of all the bodies during the 28 years from Juue 3, 1891, to June 3, 1919.

73. Are Progressed Horoscopes to be cast for Mean-time or Apparent time of birth?—As already observed meantime is a conventional affair, but apparent time is natural time. If the apparent time of birth is taken, as it ought to be, then the meantime equivalent of the apparent time of birth on a progressed date may differ from the meantime of birth on the birth-date. Hence, when the apparent time of birth is taken to cast progressed horoscopes, the time measured to will vary. But as secondary directions do not clinch correct to days, some are apt to ignore the point, and take the meantime of birth to cast progressed horoscopes, but precision requires us to go by apparent time.

LESSON X

PROGRESSION OF THE ANGLES

74. Can Progressed Angles be Directed?—The zenith and the ascendant which are the Angles used, are fixed mundane points with no progression of their own, as they have no orbital revolution or annual motion. Nor could the ecliptic be held to progress, as it too has no orbital revolution. What is taken to be the progression of the angles is really due to **diurnal rotation**, a phenomenon which has no more to do with secondary directions than orbital revolution with primary directions. It is the practice to determine the angles at the birth moment on conscutive dates after birth, and to take the excess of longitude gained by them in one day as their daily motion. On this basis, the calculated arcs of directions are made to measure to a point of time in the corresponding progressed year. For example, in George V's nativity, progressed Ascendants on July 8 and 9, 1865, were 68° 59′ and 70° 11′. So the daily motion of the Ascendant on the day is taken to be 70° 11′ − 68° 59′. i.e., 1° 12′. And when the progressed Ascendant appears to reach during the day the longitude 69° 11′, that is, 12′ ÷ 1/12 of 1° 12′ or two hours after the birth moment, calculating as if the ascendant progressed slowly and directly from 68° 59′ to 69° 11′, it is said to be in trine aspect to a radical whose longitude at birth was 309° 11′. The A.D. is said to be 69° 11′ − 68° 59′, i.e., 12′. The time measured to by the arc is held to be 12′ ÷ 1/12 of 72′, i.e., two months from the birth-date in the corresponding progressed year. Again, in regard to a progressed body whose progressed longitudes on July 8 and 9, 1865, were 158° 43′ and 160° 19′ respectively, the progressed ascendant is said to be in square aspect to the progressed body in the course of the day. For the two shorter distances are 89° 44′ and 90° 8′, and the extent 90° of the square aspect lies between them. The arc is said to be 16′. The time measured to by the arc is held to be 16′ ÷ 1/12 of 24′, i.e., 8 months from the birth-date in the corresponding progressed year. All this rests upon the assumption that the daily motion of the progressed Ascendant is 1° 12′, that is, that it has progressed directly from 68° 59′ to 70° 11′ during the day. But it is by no means correct to take such a view. For, the ascendant has progressed really from 68° 59′ to 360° 0′ and from 0° to 70° 11′ during the day, due to the diurnal rotation but not to annual motion. Consequently, its range of progress is from 68° 59′ to 360° and from 0° to 70° 11′, i.e., in all 361° 12′. Therefore, the progressed Ascendant could be directed during the day not only to the trine of the radical and to the square of the progressed body, but to the full cycle of 22

aspects, both of the increasing and the decreasing series, to these bodies and to all others. Hence, if progressed angles could possibly be directed at all, we have to take their daily motions to be about 361°, and their directions to all the twenty-two aspects and four parallels of every radical and progressed body resulting during a single progressed date and measuring to a single progressed year. Such an enormous number as, at least, 220 of its secondary directions to aspects of the radicals, and 44 to parallels of the radicals, and an almost equal number to the progressed bodies, all in one progressed date or progressed year, renders such directions to be of no value.

74. Can Progressed Angles be Directsd to?—Now, let us examine if progressed bodies could be directed to progressed angles. As the real daily motion of progressed angles is about 361°, they are vastly faster than the swiftest Moon. So none could be directed to them.

But it should be noted that progressed bodies could be directed to the radical angles, for radical angles are stationary points like all radical bodies, though radical angles could not be directed.

Contention IV—Angles cannot be Progressed.

LESSON XI

SIMPLIFIED SECONDARY DIRECTIONS

75. "Planets at Noon" Method—To cast progressed horoscopes, we take the birth-time on the progressed date, and find the positions of bodies by proportion from data given in ephemerides for Greenwich mean-noon. To save the labour of having to work several proportions of daily motions, what is known as the "**Planets at Noon**" or "**P.A.N.**" method is adopted. In this method, the positions of bodies at the Greenwich mean-noon before or after the birth-time on the progressed dates are taken straight as they are, and entered in the maps for the respective progressed dates. As one day measures to one year, the positions at Greenwich mean-noon will measure to a proportionate point of time before or after the birth-date in the corresponding progressed year. For example, George V was born at 1-18. a.m., on June 3, 1865. In erecting his progressed maps, if we take the positions of bodies at the Greenwich mean-noon following the birth-time, then we should add to the birth-date in the progressed years, the period measured to by the advanced 12 hours minus 1 hour 18 minutes, i.e., 10 hours 42 minutes. As one day measures to one year, so one hour will measure to 15 days and one minute to one-fourth of a day. Therefore, 10 hours 42 minutes will measure to 163 days from June 3 in the progressed years, that is, to November 12. This is known as the **Noon Date**. But if the positions of bodies at Greenwich mean-noon preceding the birth-time are taken, then we should count 202 days back from June 3, and we reach again November 12, the Noon Date. In this method, the period of time denoted by an arc of direction is counted onwards from the noon date. But while the positions of planets are taken as they were at the Greenwich mean-noons, the cusps are calculated for the birth-time itself. In the progressed map it is noted that the planets are as at noon of the progressed date measuring to the noon date in the progressed year, but that cusps are as at birth moment on the progressed date measuring to the birth-date in the progressed year. Some go a step further, as if to improve matters, and find the cusps also at the Greenwich mean-noon taken. But this is not done, as it ought to be done, by taking the sidereal time at the Greenwich mean-noon chosen for finding the positions of planets, but by adding to or deducting from the cusps at birth-time the proportionate value, taking that cusps progress only a few degrees in a day but not to about 361° odd as shown in Article 73. The reader is strongly urged not to spare himself a little honest labour to obtain a correct and vivid statement of facts, by adopting the usual method in preference to the P.A.N. method and its manipulations.

76. The Radical System—This is only a much simplified secondary direction to which no objection could be taken, as in the case of the P. A. N. method. Mr. Vivian E. Robson, B.Sc. has published a lucid exposition on the subject, which should be consulted by those desirous of learning the system.

PART III

LESSON XII

EPOCHAL ASPECTS

77. Epochal Aspects—Epochal Aspects are the zodiacal aspects formed at a particular epoch between two celestial bodies as they stood at the epoch. In all, the epochs adopted are five in number. (i) Synodical Lunation is the moment when the Sun and Moon stood after-birth date at the same relative distance from one another as at birth, for the ordinal number of time corresponding to the ordinal number of year of life in which a given date falls. (ii) Solar Revolution or Return is the moment just preceding a given date when the sun occupied the same longitude as at birth or at the moment of birth on the corresponding progressed date. (iii) Current Synodical Lunation is the moment just preceding a given date when the Sun and Moon stood at the same relative distance from one another as at birth. (iv) Lunar Revolution or Rotation is the moment just preceding a given date when Moon occupied the same longitude as at birth. And (v) Birth Map is for the moment of birth on a given date. The longitudes of the celestial bodies at each of these moments are determined in the usual way, and next the aspects subsisting between them, taking orbs (see Mathematical Astrology, Article 110) into consideration, are found. So there are no arcs of direction in the cases of the epochal aspects. These aspects are held to indicate incidents that are to be realised during the whole period between the epoch concerned and its succeeding one. So, there is no measurement of time in the case of epochal aspects. The new positions at an epoch are not referred to the radical or progressed positions of bodies as in directions, but only to the new positions of all other bodies at the same epoch.

We shall take three important dates in George V's life to determine on each date all the five epochal aspects, (i) July 6, 1893 when he was in his twenty-ninth year and married to the Queen, then Princess Mary, (ii) May 6, 1910 when he was in his forty-fifth year and his father Edward VII died, and he was proclaimed the king, and (iii) October 22, 1910 when he ascended the throne. Only problems relating to the second date will be fully worked out.

78. Synodical Lunation—A Synodical Lunation is the return of Moon after birth date to the same relative distance from the Sun, as it was at birth. It takes approximately 29°5 days for Moon to make a synodic return. As such, there are 12 synodic lunations in 354 days. At the birth of a child Moon will generally be at some distance, forwards or backwards from the Sun. Every 29°5 days after birth the synodical return of Moon to the same relative distance from the Sun that

it was at birth, takes place. It is held that the aspects subsisting between celestial bodies at a particular synodic lunation after birth, bear fruit in the same ordinal number of year of life as that of the synodic lunation. For example, at George V's birth Moon was 108° 37′ 11″ forwards from the Sun. This was the first synodic lunation, and the aspects between bodies subsisting at birth are held to have operated during the first year. The second synodic lunation when Moon was 108° 37′ 11″ forwards from the Sun, occurred at 6-41 p.m. G. M. T., on July 2, 1865; and so the aspects between bodies at 6-41 p.m. G. M. T., July 2, 1865, are held to bear fruit in the second year of life extending from June 3, 1866 to June 3, 1867. It will be evident that the epochal aspects at a synodical lunation are not strictly speaking epochal aspects as described in Article 77, but are intermediate between directional aspects and epochal aspects. For, they resemble directional aspects in bearing fruit at a remote period but not during the period immediately succeeding the epoch, as do the real epochal aspects; and they resemble the real epochal aspects in that they relate to the new positions of bodies at an epoch, but not to the radical or progressed positions of bodies as in directional aspects. So synodic lunations form a class by themselves.

79. Determination of all the Epochal Aspects on a given date—First find (1) the exact relative distance, correct to a second of arc, at which Moon stood from the Sun at birth, which is always obtained by deducting the Sun's longitude from Moon's longitude, previously adding 360° to Moon's longitude only when it is numerically less than that of the Sun (Dictum II). (2) The ordinal number of year containing the given date. (3) Then find the precise Greenwich mean-time on the date after birth, when Moon stood at the same relative distance from the Sun for the same number of time as the ordinal number of the year of life containing the given date. The approximate date of the synodical lunation is found by multiplying the ordinal number of lunation minus one by 29·5 days, and counting onwards from the date of birth : and its precise moment by proportion from data found in an ephemeris for the date. (4) Now, determine in the usual way, the longitudes of all bodies at the precise G. M. T. on the date after birth, and the cusps at the precise L. M. T. of synodic lunation. Lastly, (5) determine all the epochal aspects at the synodic moment.

Problem 41—Find all the epochal aspects at the Synodic Lunation, relative to July 6, 1893, in George V's nativity.

Moon's longitude at birth was	181° 3′ 4″·6
The Sun's ,,	72 25 53 ·6
∴ Moon was forwards from the Sun by	108 37 11 ·0

July 6, 1893, fell after June 3, 1893, i.e., in the 29th year

The twenty-ninth synodic lunation from birth occurred at $(29-1)\times 29.5$, i.e., 826 days after birth, i.e., on or about September 7, 1867.

	☽'s Long.	☉'s. Long.	For. Dist. of ☽	Diff.
On 7-9-67 at G. M. N.	270° 0′ 59″·1	164° 21′ 55″·6	105° 39′ 3″·5	
				6° 26′ 59″·3
7/8-9-67 G.M. mid-night	276 57 7 ·2	164 51 4 ·4	112 6 2 ·8	

∴ The distance had to Moon gain at the synodic moment was 108° 37′ 11″·0 − 105° 39′ 3″·5, i.e., 2° 58′ 7″·5.

The distance gained by Moon over the Sun in 12 hours was 6° 26′ 59″·3.

∴ 6° 26′ 59″·3 : 2° 58′ 7″·5 : : 12 hours : hours from the G.M.N. of 7-9-67.

∴ Dividing by 4, we have,

1° 36′ 44″·9 : 0° 44′ 31″·9 : : 3 hours : $\frac{1}{4}$ × ,,

The terms of the ratio have to be divided by 4, to bring them within the compass of the Table of Ternary Proportional Logarithms. When the two terms of the first ratio are divided, the result obtained need not be multiplied by the divisor used, but when the third is divided, the result obtained should be multiplied by the divisor taken (see Mathematical Astrology, Articles 51 and 200).

∴ (a.c.) 9·73037 + 0.60661 + 0·00000 = 0·33698, T. P. L. of 1 hr. 22 m. 51 s.

∴ The synodic moment on September 7, 1867, when Moon was at the same forward distance of 108° 37′ 11″ from the Sun was 1 hr. 22 m. 51 s. × 4 or 5 hr. 31m. 24 s. p.m. G.M.T. or 5 hr. 30 m. 47 s. L.M.T. on September 7, 1867, when the R. A. M. C. was 249° 1′ 15″. To test if the moment arrived at is correct, find the diurnal proportional arcs of the Sun and Moon for the odd period and apply it to their respective previous positions taken from the ephemeris, and see if Moon is forwards of the Sun by exactly the same distance. Having tested your result, cast the horoscope for G.M.T. 5 hr. 31 m. 24 s p.m., or L.M.T. 5 hr. 30 m. 47 s. p.m. on September 7, 1867. And now find all the epochal aspects including the parallel of declination between the several pairs of bodies.

Problem 42—Find all the epochal aspects at the Synodical Lunation, relative to May 6, 1910, in George V's nativity.

Moon was forwards from the Sun at birth by 108° 37′ 11″·0.

May 6, 1910 fell in the 45th year of his life.

The 45th synodic lunation was $(45-1)\times 29{\cdot}5$ or 1298 days from birth, i.e., on or about December 22, 1868.

	☽'s Long.	☉'s Long.	For. Dist. of ☽	Diff.
23-12-68, G.M.N.	16° 36′ 12″·4	272° 1′ 5″·1	104° 35′ 7″·3	
				5° 40′ 29″·4
23/24-12-68, mid-night	22 47 15 ·8	272 31 39 ·1	110 15 36 ·7	

∴ The distance Moon had to gain at the synodic moment was 108° 37′ 11‴·0 − 104° 35′ 7‴·3, i.e., 4° 2′ 3‴·7.

The distance gained by Moon in 12 hours over the Sun was 5° 40′ 29‴·4.

5° 40′ 29‴·4 : 4° 2′ 3‴·7 : : 12 hours : No. of hours from the G. M. N.

∴ 1° 25′ 7‴·4 : 1° 0′ 30‴·9 : : 3 hours : ¼ × ,,

9·67477 + 0·47341 + 0·00000 = 0·14818, T. P. L. of 2 hr. 7 m. 58 s.

And 4 times 2 hr. 7 m. 58 s is 8 hr. 31 m. 52 s.

∴ The moment of the synodic lunation was 8 hr. 31 m. 52 s p.m., G.M.T. or 8-31-15 p.m. L.M.T. on December 23, 1868, when R.A.M.C. was 40° 29′ 0″. Now cast the horoscope for G.M.T. 8-31-52 p.m., or L.M.T. 8-31-15 p.m., on December 23, 1868. And now find all the epochal aspects including the parallel of declination.

Problem 43—Find all the epochal aspects at the Synodic Lunation, relative to October 22, 1910, in George V's nativity.

Moon was forwards from the Sun at birth by 108° 37′ 11‴·0.

October 22, 1910, fell in the 46th year of George V's life.

The 46th synodic lunation was (46 − 1) × 29·5 i.e., 1328 days from birth, i.e., on or about January 22, 1869.

	☽'s. Long.	☉'s Long.	For. Dist. of ☽.	Diff.
22-1-69, G. M. N.	49° 48′ 17‴·0	302° 34′ 51‴·4	107° 13′ 25‴·6	
				6° 0′ 15‴·6
22/23-1-69, mid-night	56 19 2 ·6	303 5 21 ·4	113 13 41 ·2	

∴ The distance Moon had to gain at the synodic moment was 108° 37′ 11‴·0 − 107° 13′ 25‴·6, i.e., 1° 23′ 45‴·4.

∴ 6° 0′ 15‴·6 : 1° 23′ 45‴·4 : : 12 hours ; No. of hours from G.M.N. of 22-1-69.

∴ 1° 30′ 3‴·9 : 0° 20′ 56‴·4 : : 3 hours : ¼ × ,,

9·69928 + 0·93431 + 0·00000 = 0·63359 = T. P. L. of 0 hr. 41 m. 51s.

And 4 times 0 hr. 41 m. 51s. = 2 hr. 47 m. 24s.

∴ The moment of the synodic lunation was 2 hr. 47 m. 24 s. p.m. G.M.T. or 2-46-47 L.M.T. on January 22, 1869, when the R.A.M.C. 343° 41′ 0″. Now cast the horoscope for the G.M.T. 2 hr. 47 m. 24 s. p.m., i.e., L.M.T. 2-46-47 p.m. And now find all the epochal aspects including the parallel of declination.

80. Solar Revolution or Return—Solar Revolution is the return of the Sun to the same longitude as it was at birth. This occurs once in a year about the

birth-day. It is held that the aspects subsisting between celestial bodies at the moment when the Sun occupies the same longitude as at birth, operate during the year succeeding the moment. For example, at George V's birth the Sun was at 72° 25′ 53″·6, and the effects of the aspects subsisting at the moment in every year when the Sun was at 72° 25′ 53″.6, are said to be felt during the whole year succeeding the moment. It will not do to take the Sun's longitude at birth correct to a minute of arc, but it should be taken correct to a second of arc or even to one-tenth of a second of arc. For, if the longitude is taken correct to a minute of arc, an error of one minute in the Sun's longitude will cause an error of about 24 minutes of time, as Sun moves approximately 60 minutes of arc in one day or 1440 minutes of time, and an error of 24 minutes of time will produce an error of about 14 minutes of arc in Moon's longitude, and about 6 degrees in the longitudes of the cusps. The approximate moment of return is readily found from an ephemeris: and the precise moment by proportion as usual. The map of the heavens erected for the moment of the solar revolution or return in a year is also known as the **birth-day map**; for the solar returns take place usually about the birth-date in every year. The aspects bear fruit during the year extending from one solar return to the next.

Problem 44—Find all the epochal aspects at the Solar Revolution, relative to July 6, 1893, in George V's nativity.

The longitude of the Sun at birth was 72° 25′ 53″·6.

July 6, 1893, fell in the 29th year measuring from June 3, 1893.

∴ The solar return was on or about June 3, 1893.

	☉'s. Long.	Daily motion.
2-6-93 G.M.N.	72° 6′ 59″·9	
		0° 57′ 25″·2
3-6-93 G.M.N.	73 4 25 ·1	

The Sun had to advance 72° 25′ 53·6 − 72° 6′ 59″·9, i.e., 0° 18′ 53″·7.

∴ 0° 57′ 25″·2 : 0° 18′ 53″·7 : : 24 hours : No. of hours from G. M. N., 2-6-93.

Dividing the third term by 8, we get.

9·50379 + 0·97892 + 0·00000 = 0·48271, T. P. L., 0 hr. 59 m. 14 s.

∴ Now multiply 0 hr. 59 m. 14 s by 8, and we get 7 hr. 53 m. 52 s.

The solar return was at 7-53-52 p.m. G.M.T. or 7-53-15 p.m., L.M.T. on June 2, 1893, when the R.A.M.C. was 189° 49′ 0″. Now cast the horoscope for 7-53-52 p.m. G.M.T., or 7-53-15 p.m. L.M.T. on June 2, 1893. And now find all the epochal aspects.

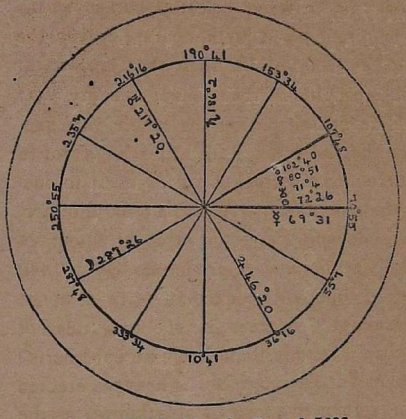


Fig. XVIII—Map for June 2, 1893.

Declinations.

M. C.	4	S	14
Asc.	22	S	5
☉	22	N	18
☽	27	S	20
☿	22	N	15
♀	23	N	33
♂	24	N	2
♃	15	N	49
♄	0	S	3
♅	13	S	33
♆	20	N	39

	♄	♅	♆	♃	♂	☉	♀	☿
☽	S □	A ☍	S Bq.	S △	S ☌	A Bq.		S Bq.
☿	S △	S ⚻	A ♂		‖	A ♂ & ‖	‖	
♀		A ☐			‖	‖		
☉	S △	S Bq.	S ♂		S ⚺ ‖			
♂	S □	S △	S ⚺	A *				
♃			‖					
♆	S △							
♅	A ⚺							

Problem 45—Find all the epochal aspects at the Solar Revolution, relative to May 6, 1910, in George V's nativity.

The longitude of the Sun at birth was 72° 25′ 53″·6.

May 6, 1910, fell in the 45th year measuring from June 3, 1909.

∴ The solar return was on or about June 3, 1909.

	☉'s. Long.	Daily motion.
3-6-09 G.M.N.	72° 14′ 25″·1	0° 57′ 24″·7
4-6-09 G.M.N.	73 11 49 ·8	

The sun had to gain 72° 25′ 53″·6 − 72° 14′ 25″·1, i.e., 0° 11′ 28″·5.

∴ 0° 57′ 24″·7 : 0° 11′ 28″·5 : : 24 hours : No. of hours from G.M.N. 3-6-09.

Dividing the third term by 8, we get,

9·50373 + 1·19552 + 0·00000 = 0·69925, T.P.L. of 0 hr. 35 m. 58·6 s.

And 8 times 0 hr. 35 m. 58.6 s = 4 hr. 47 m. 49 s.

The solar return was at 4 hr. 47 m. 49 s. p.m., G.M.T., or 4 hr. 47 m. 12 s. p.m., L.M.T. on June 3, 1909, when R.A.M.C. was 143° 17′ 45″.

Now cast the horoscope for G.M.T., 4-47-49 p.m., or L.M.T. 4-47-12 p.m. on June 3, 1909. And now find all the epochal aspects.

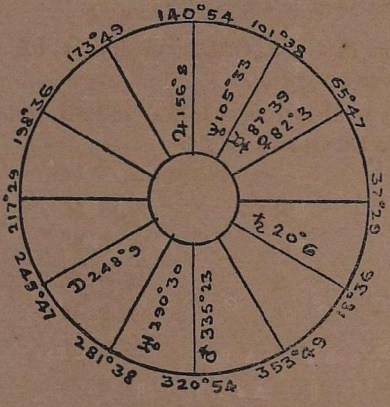


Fig. XIX—Map for June 3, 1909.

	Declinations.		
M. C.	14	N	32
Asc.	14	S	1
☉	22	N	18
☽	20	S	54
☿	23	N	0
♀	23	N	43
♂	12	S	10
♃	10	N	23
♄	5	N	42
♅	22	S	21
♆	21	N	51

	☽	♀	☉	♂	☿	♃	♄	♅	♆
☽		S ∠ & ‖	A Bq.	S △	S □		S □ ‖	A ♂ & ‖	
♀			S ⚺ & ‖	S ✶		A ♂ & ‖	‖	‖	
☉		A Bq. & ‖		A ✶	S □	‖	S □ ♅		
♂		A ∠		S ∠	A ♂ & ‖	S △			
☿		‖					‖		
♃		S ☐		S ☐					
♄		A □	S □						
♆		A ♂ & ‖							

Problem 46—Find all the epochal aspects at the Solar Revolution, relative to October 22, 1910, in George V's nativity.

The longitude of the Sun at birth was 72° 25′ 53″·6.

October 22, 1910, fell in the 46th year measuring from June 3, 1910.

∴ The solar return was on or about June 3, 1910.

	☉'s. Long.	Daily motion.
3-6-1910 G.M.N.	72° 0′ 37″·4	
		0° 57′ 27″·6
4-6-1910 G.M.N.	72 58 5 ·0	

The Sun had to gain 72° 25′ 53‴·6 − 72° 0′ 37‴·4, i.e., 0° 25′ 16‴·2.

∴ 0 °57′ 27‴·6 : 0° 25′ 16‴·2 : : 24 hours : No. of hours from G.M.N. 3-6-10.

Dividing the third term by 8, we get,

9·50409 + 0·85266 + 0·00000 = 0·35675, T.P.L. of 1 hr. 19 m. 9·8 s.

And 8 times 1 hr. 19 m. 9.8 s = 10 hr. 33 m. 18·4 s.

∴ The solar return was at 10 hr. 33 m. 18 s. p.m., G.M.T., or 10-32-41 p.m., L.M.T. on June 3, 1910, when R.A.M.C. was 229° 40′ 0″.

Now cast the horoscope for G.M.T. 10-33-18 p.m. or L.M.T. 10-32-41 p.m., on June 3, 1910. And now find all the epochal aspects.

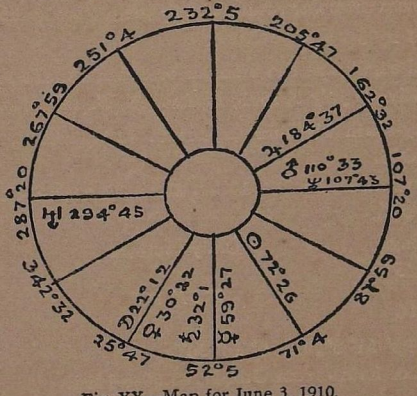


Fig. XX—Map for June 3, 1910.

	Declinations.		
M.C.	18	S	18
Asc.	22	S	21
☉	22	N	18
☽	5	N	45
☿	16	N	27
♀	9	N	31
♂	23	N	10
♃	0	S	32
♄	10	N	1
♅	21	S	41
♆	21	N	38

	♃	♅	♆	♄	☿	♂	☉	♀
☽		A □	S □			S □	S ∠	
♀		S □		A ♂ & ‖	S ⚹	S □		
☉	S △	S ☐ & ‖	‖		S ♂	‖		
♂		A ☍ & ‖	S ♂ & ‖					
☿	S △	A △		S ⚹				
♄		S □						
♆		‖						
♅								

81. Solar Return to the Progressed Sun—According to some, the moment when the Sun returns to its longitude on the progressed date corresponding to the year of the give date, instead of to the longitude of the radical Sun as in Article 80, is taken. For, the Sun while he completes the ecliptic circle in one year, does not move through 360° with reference to a place, but does so only when he has moved through 361° ecliptic degrees. In other words, it is only after one year and one day, that the Sun returns to the same mundane position after birth. The horoscope for the moment of the solar return to the progressed longitude of the Sun is cast, and all the epochal aspects are determined. If this system is adopted, then a progressed day will measure not to one year but to one year and one day; and consequently the anniversary of birth will not fall on the date of birth in every year but one day after birth for every subsequent year. These aspects are held to bear fruit during the year and one day from the solar return to one progressed position to the solar return to the succeeding progressed position.

Problem 47—Find all the epochal aspects at the moment of Solar Return to the progressed longitude of the Sun, relative to July 6, 1893, in George V's nativity.

July 6, 1893 fell after the twenty-ninth birth-date, June 3, 1893, and the twenty-ninth progressed date is July 1, 1865.

The Sun's longitude at the A.T. of birth, i.e., at 13 hr. 23 m. 39 s. or 1-24 a.m. G.M.T. on July 1, 1865, was 99° 9′ 55″.

	☉'s Long.	Daily motion.
30-6-93	98° 51′ 5″	
		0° 57′ 11″
1-7-93	99 48 16	

The Sun had to gain 99° 9′ 55″ − 98° 51′ 5″, i.e., 0° 18′ 50″.

∴ 57′ 11″ : 18′ 50″ : : 24 hours : No. of hours from G.M.N. of 30-6-1893.

Dividing the third term by 8, we have,

9·50200 + ·98035 = 0·48235, T.P.L. of 0 hr. 59 m. 17·1 s.

∴ The moment of Solar Return to its longitude on the corresponding progressed date was 7 hr. 54 m. 17 s. after G.M.N. on 30-6-1893, i.e., 7-54-17 p.m. G.M.T. or 7-53-40 p.m. L.M.T., when the R.A.M.C. was 217° 30′ 45″.

Now cast the horoscope for the moment of return on June 30, 1893, and find all the epochal aspects.

Problem 48—Find all the epochal aspects at the Solar Return to the Progressed longitude of the Sun, relative to May 6, 1910, in George V's nativity.

The Sun's longitude at the A.T. of birth on the 45th progressed date, i.e., at G.M.T. 1-26 a.m. on July 17, 1865, was 114° 25′ 14″. The Sun returned to the progressed longitude, 114° 25′ 14″, in the 45th year at 4-46-15 p.m. G.M.T., i.e., 4-45-38 p.m. L.M.T. on July 17, 1909, when the R.A.M.C. was 186° 16′ 15″.

Now cast the horoscope for the moment of return on July 17, 1909, and find all the epochal aspects.

Problem 49—Find all the epochal aspects at the Solar Return to the Progressed longitude of the Sun, relative to October 22, 1910, in George V's nativity.

The Sun's longitude at the A.T. of birth on the 46th progressed date, i.e., at 1-26 a.m. G.M.T., on July 18, 1865 was 115° 22′ 29″. The Sun returned to the progressed longitude, 115° 22′ 29″, at 10-24-0 p.m. G.M.T. or 10-23-23 p.m. L.M.T. on July 18, 1910, when the R.A.M.C. was 271° 41′ 15″.

Now cast the horoscope for the moment of Solar Return on July 18, 1910, and find all the epochal aspects.

It may be observed that the validity of Solar Return to the progressed longitude is questionable. For example, if Problem 48 is worked out, and the aspects will be found not quite significant as compared with those given in the corresponding Problem 45.

82. Current Synodical Lunations—Current Synodical Lunations are those just preceding a given date. So when a date is given we should ascertain the moment just previous to it, at which moon was at the same relative distance from the Sun as at birth. The effect of the aspects formed at the moment are viewed to be realised during the synodic month of 29·5 days from the moment. These returns are called **current synodical lunations**, to distinguish them from the lunation described in Article 79.

83. Determination of all the aspects at a Current Synodical Lunation—A Synodical Lunation occurs once in 29·5 days, and so Moon gains in elongation on on an average 12° daily. Always we want to know the moment of the just previous synodic lunation. So we should find (i) the distance of Moon from the Sun at birth, and (ii) the date and the precise G.M.T. of the synodic lunation just previous to the given date. The former is easily found as usual, by deducting the Sun's longitude at birth from Moon's longitude at birth, applying Dictum II when necessary. To find the latter we should ascertain the distance of Moon from the Sun at G.M.N. on the given date by subtracting the Sun's longitude from Moon's, adding 360° to Moon's position if it is numerically less (Dictum II), and taking the difference with no rectification, as the distance from the Sun to Moon on the date. Next, divide the distances at birth and at G.M.N. on the given date, both taken correct to a degree by 12, to find the Age of Moon in days. The Age of Moon on the given date may be greater or less than its age at birth, the maximum Age of Moon, taken approximately, is 30 days. When the Age of Moon on the given date is greater, the difference between the two ages gives the number of days we have to count back from the given date to reach the day of the previous synodic lunation : and when the Age of Moon on the given date is less, add 30 to it and deduct the

Age of Moon at birth, and with the number of days obtained count back from the given date to get at the day of the previous lunation. Now, take an ephemeris for the year and find the positions of the Sun and Moon on the date counted back, and ascertain the precise moment of the synodic lunation, and cast the horoscope for the moment of synodic lunation, and find all the aspects subsisting at the moment.

Problem 50—Find all the epochal aspects at the Current Synodical Lunation, relative to July 6, 1893, in George V's nativity.

At birth the distance from the Sun to Moon was 108° 37′ 11‴0, i.e., the approximate Age of Moon was 9 days.

At G.M.N. on July 6, 1893, the approximate distance from the Sun to Moon was 360° + 9° − 104°, i.e., 265°, and so Moon's Age was 22 days. On the given date Moon is older than at birth. So counting back 22 − 9, i.e., 13 days from July 6, 1893, we reach June 23, 1893.

On reference to an ephemeris for 1893 we find the following data :—

	☽'s Long.	☉'s Long.	Distance.	Diff.
22-6-1893 G.M.N.	197° 5′ 50‴5	91° 13′ 31‴8	105° 52′ 18‴7	
				5° 34′ 46‴2
22-6-1893 G.M.M.	203 9 13 ·2	91 42 8 ·3	111 27 4 ·9	

The distance Moon had to gain was 108° 37′ 11″ − 105° 52′ 18‴7, i.e., 2° 44′ 52‴3.

∴ 5° 34′ 46‴2 : 2° 44′ 52‴3 : : 12 hours : No. of hours from G.M.N. of 22-6-93.

Dividing all the terms by 4, we have,

9·667441 + 0·64019 + 0·00000 = 0·30760, T.P.L., of 1 hr. 28 m. 38·9 s.

4 times 1 hr. 28 m. 38·9 s. is 5 hr. 54 m. 35 s.

∴ The moment of the previous current synodic lunation was 5-54-35 p.m. G.M.T. or 5-53-58 p.m. L.MT., on June 22, 1893, when the R.A.M.C. was 179° 37′ 45″.

Now cast the horoscope for 5-55 p.m. G.M.T., i.e., 5-53-58 p.m. L.M.T. on June 22, 1893, and find all the epochal aspects.

Problem 51—Find all the epochal aspects at the Current Synodical Lunation, relative to May 6, 1910 in George V's nativity.

At birth the approximate Age of Moon was 9 days.

At G.M.N. on May 6, 1910 the approximate distance from the Sun to Moon was 360° + 7° − 45°, i.e., 322°, and so Moon's age was 27 days. On the given date Moon was older than at birth, so counting back 27 − 9, i.e., 18 days from May 6, 1910, we reach April 18, 1910.

On reference to an ephemeris for 1910, we find the following data :—

	☽'s Long.	☉'s Long.	Distance.	Diff.
17/18-4-10 G.M.M.	134° 0′ 43″·8	27° 4′ 51″·4	106° 55′ 52″·4	
				5° 50′ 16″·7
18-4-10 G.M.N.	140 20 19 ·2	23 34 30 ·1	112 46 9 ·1	

The distance Moon had to gain was 108° 37′ 11″ − 106° 55′ 52″·4, i.e., 1° 41′ 18″·6.

∴ 5° 50′ 16″·7 : 1° 41′ 18″·6 : : 12 hours : No. of hours from G.M.M. of 13/18-4-10.

Dividing all the terms by 4, we have,

9·687084 + 0·851681 + 0·000000 = 0·538765, T.P.L. of 0 hr. 52 m. 3·6 s.

4 times 0 hr. 52 m. 3·6 s. is 3 hr. 28 m. 4 s.

∴ The moment of the previous current synodic lunation was 3-28-14 a.m. G.M.T. or 3-27-37 a.m. L.M.T. on April 18, 1910, when the R.A.M.C. was 257° 16′ 30″.

Now cast the horoscope for 3-28 a.m. G.M.T., i.e., 3-27-37 a.m. L.M.T. on April 18, 1910, and find all the epochal aspects.

Problem 52—Find all the epochal aspects at the Current Synodical Lunation, relative to October 22, 1910, in George V's nativity.

At birth the approximate Age of Moon was 9 days.

At G.M.N. on October 22, 1910, the approximate distance from the Sun to Moon was 360° + 83° − 208°, i.e., 235°, and so Moon's age was 235 ÷ 12, i.e., 19 days.

On the given date Moon was older than at birth, so counting back 19 − 9, i.e., 10 days from October 22, 1910, we reach October 12, 1910.

	☽'s Long.	☉'s Long.	Distance.	Diff.
12/13-4-10 G.M.M.	305° 25′ 8″·6	198° 46′ 38″·9	106° 38′ 29″·7	
				6° 0′ 12″·3
13-4-10 G.M.N.	311 55 3 ·2	199 16 21 ·2	112 38 42 ·0	

The distance Moon had to gain was 108° 37′ 11″ − 106° 38′ 29″·7, i.e., 1° 58′ 41″·3.

∴ 6° 0′ 12″·3 : 1° 58′ 41″·3 : : 12 hours : No. of hours from G.M.N. of 12/13-4-10.

Dividing all the terms by 4, we have,

9·69922 + ·78292 + 0·00000 = 0·48214, T.P.L. of 0 hr. 59 m. 18·7 s.

4 times 0 hr. 59 m. 18·7 s is 3 hr. 57 m. 15 s.

∴ The moment of the previous current synodic lunation was 3-57-15 a.m. G.M.T., i.e., 3-56-38 a.m. L.M.T. on October 13, 1910, when the R.A.M.C. was 79° 59′ 30″.

Now cast the horoscope for 3-57 a.m. G.M.T., i.e., 3-56-38 a.m. L.M.T. on October 13, 1910, and find all the epochal aspects.

84. Lunar Revolutions or Returns—Lunar Revolution is the return of Moon to the same longitude as it was at birth. This occurs once in about 27 days. It is held that the aspects subsisting between bodies at the moment when Moon occupies the same longitude as at birth, bear fruit during the lunar month of 27 days succeeding the moment of return. For example, at George V's birth the longitude of Moon was 181° 3′ 4″·6, and the effects of the aspects subsisting at every lunar return, i.e., after about every 27 days from birth, are said to be felt during the 27 days succeeding the moment of return. The longitude of Moon may be taken correct to a minute of arc, for the difference of one minute of arc in the Moon's position will produce only an error of only two minutes of time. The approximate moment of return is readily found from an ephemeris: and the precise moment is found by proportion as usual. The map erected for the moment of Lunar Return is also known as the **monthly map**.

Problem 53—Find all the epochal aspects at the Lunar Return just prior to July 6, 1893, in George V's nativity.

The longitude of Moon at birth was 181° 3′ 4″·6.

Just prior to July 6, 1893, Moon returned to its longitude at birth between the Greenwich mean mid-night on June 20/21, 1893, and G.M.N. on June 21, 1893.

	☽'s Longitude.	Motion during 12 hours.
20/21-6-93 G.M. mid-night	178° 31′ 37″·9	
		6° 16′ 3″·2
21-6-93 G.M.N.	184 47 41 ·1	

Moon had to advance 181° 3′ 4″·6 – 178° 31′ 37″·9, i.e., 2° 31′ 26″·7.

∴ 6° 16′ 3″·2 : 2° 31′ 26″·7 : : 12 hours : No. of hours from the mid-night.

Dividing all the terms by 4, we have,

9·71792 + 0·67708 + 0·00000 = 0·39500, T.P.L. of 1 hr. 12 m. 29·6 s.

4 times 1 hr. 12 m. 29·6 s. is 4 hr. 49 m. 58 s.

∴ The Lunar Return was at 4-49-58 a.m. G.M.T. or 4-49-20 a.m. L.M.T. on June 21, 1893, when the R.A.M.C. was 341° 56′ 45″.

Now cast the horoscope for G.M.T. 4-50 a.m., i.e., L.M.T. 4-49-20 a.m. on June 21, 1893, and find all the epochal aspects.

Problem 54—Find all the epochal aspects at the Lunar Return just prior to May 6, 1910, in George V's nativity.

The longitude of Moon at birth was 181° 3′ 4″·6.

	☽'s Longitude.	Motion during 12 hours.
21-4-1910 G.M.N.	177° 8′ 20″·5	
		5° 59′ 41″·7
21/22-4-1910 G.M.M.	183 8 2 ·2	

∴ Moon had to advance 181° 3′ 4″·6 − 177° 8′ 20″·5, i.e., 3° 54′ 44″·1.

∴ 5° 59′ 41″·7 : 3° 54′ 44″·1 : : 12 hours : No. of hours from the G.M.N.

Dividing all the terms by 4, we have,

9·69860 + ·48676 + 0·00000 = 0·18536, T.P.L. of 1 hr. 57 m. 28 s.

4 times 1 hr. 57 m. 28 s is 7 hr. 49 m. 52 s.

∴ The Lunar Return was at G.M.T. 7-49-52 p.m. or L.M.T. 7-49-15 p.m. on April 21, 1910, when the R.A.M.C. was 146° 18′ 45″.

Now cast the horoscope for G.M.T. 7-50 p.m. or L.M.T. 7-49-15 p.m. on April 21, 1910, and find all the epochal aspects.

Problem 55—Find all the epochal aspects at the Lunar Return just prior to October 22, 1910, in George V's nativity.

The longitude of Moon at birth was 181° 3′ 4″·6.

	☽'s Longitude.	Motion during 12 hours.
2-10-10 G.M.N.	178° 43′ 53″·0	
		6° 10′ 11″·6
2/3-10-10 G.M.M.	184 54 4 ·6	

Moon had to advance 181° 3′ 4″·6 − 178° 43′ 53″·0, i.e., 2° 19′ 11″·6.

∴ 6° 10′ 11″·6 : 2° 19′ 11″·6 : : 12 hours : No. of hours from the G.M.N.

Dividing all the terms by 4, we have,

9·71109 + 0.71371 + 0·00000 = 0·42480, T.P.L. of 1 hr. 7 m. 40·9 s.

4 times 1 hr. 7 m. 40·9 s is 4 hr. 30 m. 43·6 s.

∴ The Lunar Return was at G.M.T. 4-30-44 p.m. or L.M.T. 4-30-7 p.m. on October 2, 1910, when the R.A.M.C. was 258° 2′ 15″.

Now cast the horoscope for the moment, and find all the epochal aspects.

86. Diurnal Map—Diurnal Map is the one cast for the moment of birth on a given date. Usually the mean-time of birth is taken. According to some, the apparent time of birth (see Article 72) on every day is taken, and its mean-time

equivalent is found, and the horoscope is cast for it. We shall adopt the latter view. The aspects subsisting at the moment of birth on every day is held to portend events to transpire during the day.

Problem 56—Find all the epochal aspects at the Moment of Birth on July 6, 1893, in George V's nativity.

The G.M.T. of birth was 1-18 a.m.

The L.M.T. of birth was 1-17-23 a.m.

The Equation of time on the date, as applied to mean-time, was + 2 m. 13 s.
∴ Local Apparent time of birth was 1-19-36 a.m.

The Equation of time, as applied to apparent time, at the midnight of July 5/6 was + 4 m. 26 s.

∴ The L.M.T. of birth on July 6, 1893, was 1-24-2 a.m., and the G.M.T. was 1-24-39 a.m., when the R.A.M.C. was 305° 16′ 0″.

Now cast the horoscope for the moment, and find all the epochal aspects.

Problem 57—Find all the epochal aspects at the Moment of Birth on May 6, 1910, in George V's nativity.

The Local Apparent time of birth was 1-19-36 a.m.

The Eq. of time as applied to apparent time at G.M. midnight on May 5/6, 1910 was − 3 m. 25 s.

∴ The L.M.T. of birth on May 6, 1910, was 1-16-11 a.m., and the G.M.T. was 1-16-48 a.m., when the R.A.M.C. was 242° 4′ 0″.

Now cast the horoscope for the moment, and find all the epochal aspects.

Problem 58—Find all the epochal aspects at the Moment of Birth on October 22, 1910, in George V's nativity.

The Local Apparent time of birth was 1-19-36 a.m.

The Eq. of time as applied to apparent time at G.M. midnight on October 22/23, 1910, was − 15 m. 17 s.

∴ The L.M.T. of birth on October 22, 1910, was 1-4-19 a.m., or the G.M.T. was 1-4-56 a.m., when the R.A.M.C. was 45° 40′ 0″.

Now cast the horoscope for the moment, and find all the epochal aspects.

PART IV

CURRENT ASPECTS

LESSON XIII

TRANSITS

87. Transits—Transits are current aspects formed between the current positions of bodies and the radical or progressed positions of bodies and angles. A transit is the passage of a body over the radical or progressed positions of bodies and angles. The passage of a body over the point opposite to a radical or progressed position is also regarded to be a transit. So transits are conjunctions or oppositions. In order to differentiate these conjunctions and oppositions from the ordinary ones, they are termed **conjunctions by transit**, and **oppositions by transit.** Transits by the square and by the trine are adopted by some, but are of subordinate value ; and transits by the other aspects are held to be too feeble to deserve notice. So, we have only four aspects to be noted in transits. The radical or progressed position passed over by a body is said to be the **transitted point or significator.** Of the four angles and the nine bodies only the two angles, the Mid-heavens and the Ascendant, and the two luminaries, the Sun and Moon, are universally held to be the four important significators, and the remaining seven planets are taken to be significators of minor value. The body passing over a radical or progressed position is the **transitting body or promittor or exciter**, and it may be any one of the nine bodies. Jupiter, Saturn, Uranus and Neptune being tardy in motion, their transits over the significators last for a long period, and as such are viewed to be telling promittors : Mars being a body with considerable velocity, its transits are less lasting than the former, but decisive, and so important : Moon, Mercury, Venus and the Sun being quickly moving bodies, their transits are ephemeral, lasting only a few hours as in the case of Moon, or a few days as in the case of the rest. But the transits of the luminaries, the Sun and Moon, are held to be very effective, especially when they pass through the houses of a horoscope. To sum up, the transits of Mars, Jupiter, Saturn, Uranus and Neptune by conjunction, opposition, square and trine over the radical or the progressed positions of the four essential significators, the Mid-heavens, the Ascendant, the Sun and Moon, are the only important transits to be determined.

Transits include also the New Moons, the Full Moons, and the Eclipses. New Moon or Moon when in conjunction with the Sun, and Full Moon or Moon when in

opposition to the Sun, are held to be very important transits. Always Solar Eclipses occur at a New Moon, and Lunar Eclipses at a Full Moon. So eclipses are also transits which are still more important than the ordinary New and Full Moons.

88. Determination of Transits at a given time—We have first to find the positions of Conjunction, Opposition, Square and Trine with the two angles and the two luminaries in particular, both at birth and at the moment of birth on the progressed date corresponding to the given time. These positions of each set of radicals and of the progressed may be arranged separately in their numerically increasing order, to facilitate the spotting of transits. Next, the range of positions of all the nine bodies during the given period should be noted.

The given period may be one day or any longer period. The range of the positions of a body during a period are its positions at the Greenwich mean-midnights at the beginning and at the end of the period. Record also all Eclipses, New Moons, and Full Moons transpiring during the given period. This is generally done with the help of an ephemeris for the given time. Now all coincidences of the current positions of the nine bodies with the radical and progressed positions of the four aspects to the two angles and the two luminaries are noted as transits. For example, if we want to ascertain all the transits that operated in the 45th year of George V's life, that is, from June 3, 1909 to June 3, 1910, we take (i) the positions of the two angles and the two luminaries at birth, and (ii) their positions at the apparent moment of birth on the corresponding progressed date, i.e., 1-26 a.m. G.M.T. on July 17, 1865. To each of these positions of either set, we add and subtract in succession the aspect extents of Conjunction, Square, Trine and Opposition, i.e., 0°, 90°, 120° and 180°, to find the corresponding aspects by transit both of the decreasing and the increasing series. Next, the aspect positions of each set are arranged in their numerically increasing order. Lastly, refer to the ephemerides for 1909 and 1910, and take the range of longitudes passed through during the year June 3, 1909 to June 3, 1910 by each of the nine bodies. In transits over the Radicals the range of positions is the one from the position at the Greenwich mean-midnight on June 3, 1909 to the position at the Greenwich mean midnight on June 3, 1910: and in the case of transits over the Progressed places, it is that from the midnight of July 17, 1909 to July 18, 1910. Now, spot all coincidences between the aspect positions and the current positions of each set, radical or progressed. The concurrences so marked off will be the Transits. In determining Transits, an orb of one or two degrees is usually allowed. Also note the radical and the progressed houses of a horoscope passed through by each body. Eclipses, New Moons and Full Moons can be found from the aspectarian given in an ephemeris. Therefore, we should have two schedules prepared in regard to the aspect positions of (i) the Radicals and (ii) the Progressed. The schedule of the radical positions

and their aspects, no matter what the date may be, will be the same; but the schedule of the progressed positions and their aspects, will vary with each progressed date, and so a separate one should be prepared for each progressed date. For example, in George V's nativity Schedule XXI of the Radicals and their aspects will hold true for all given dates, but Schedules XXII, XXIII and XXIV of the Progressed positions and their aspects will relate to the three different dates selected, e.g., July 6, 1893, May 6, 1910, and October 22, 1910.

The Radicals and their Aspects.

	Conjunction	Square	Trine	Opposition
Asc.	2° 3′	92° 3′ 272 3	122° 3′ 242 3	182° 3′
♆	10 10	100 10 280 10	130 10 250 10	190 10
♀	39 39	129 39 309 39	159 39 279 39	219 39
☿	48 29	138 29 318 29	168 29 288 29	228 29
☉	72 26	162 26 342 26	192 26 312 26	252 26
♅	88 37	178 37 358 37	208 37 328 37	268 37
♂	125 35	215 35 35 35	245 35 5 35	305 35
☽	181 3	271 3 91 3	301 3 61 3	1 3
♄	204 6	294 6 114 6	324 6 84 6	24 6
♃	265 40	355 40 175 40	25 40 145 40	85 40
M.C.	270 47	0 47 180 47	30 47 150 47	90 47

Now arranging these positions in their numerically increasing order we obtain the following schedule:—

Schedule XXI—Radicals and their Aspects for the twenty-ninth year.

Position	Aspect
0° 47′	□ M.C.
1 3	♇ ☽
2 3	I Rad. House, & ♂ Asc.
5 35	△ ♂
10 10	♂ ♆
24 6	♇ ♄
25 40	△ ♅
30 47	△ M.C.
35 35	□ ♂
39 39	♂ ♀
48 29	♂ ♇
48 41	II Rad. House
61 3	△ ☽
72 26	♂ ☉
72 36	III Rad. House
84 6	△ ♄
85 40	♇ ♅
88 37	♂ ♅
90 47	IV Rad. House, & ♇ M.C.
91 3	□ ☽
92 3	□ Asc.
100 10	□ ♆
109 7	V Rad. House
114 6	□ ♄
122 3	△ Asc.
125 35	♂ ♂
129 39	□ ♀
130 10	△ ♆
133 41	VI Rad. House
138 29	□ ♇
145 40	△ ♅
150 47	△ M.C.
159 39	△ ♀
162 26	□ ☉
168 29	△ ♇
175 40	□ ♅
178 37	□ ♅

Position	Aspect
180° 47′	□ M.C.
181 3	♂ ☽
182 3	VII Rad. House, & ♇ Asc.
190 10	♇ ♆
192 26	△ ☉
204 6	♂ ♄
208 37	△ ♅
215 35	□ ♂
219 39	♇ ♀
228 29	♇ ♇
228 41	VIII Rad. House
242 3	△ Asc.
245 35	△ ♂
250 10	△ ♆
252 26	♇ ☉
252 36	IX Rad. House
265 40	♂ ♅
268 37	♇ ♅
270 47	X Rad. House, & ♂ M.C.
271 3	□ ☽
272 3	□ Asc.
279 39	△ ♀
280 10	□ ♆
288 29	△ ♇
289 7	XI Rad. House
294 6	□ ♅
301 3	△ ☽
305 35	♇ ♂
309 39	□ ♀
312 26	△ ☉
313 41	XII Rad. House
318 29	□ ♇
324 6	△ ♄
328 37	△ ♅
342 26	□ ☉
355 40	□ ♅
358 37	□ ♅

Problem 59—Find all the transits over the radicals, relative to July 6, 1893, in George V's nativity.

The range of the current positions of the bodies from midnight to midnight on July 6, 1893, and their transits of houses were as :—

			Transits				Transits
☽	2° 35′ to 16° 6′	XII and I		♃	53° 17′ to 53° 30′		II
☉	104 6 to 105 3	IV		♄	186 40 to 186 42		VII
☿	129 52 to 131 3	V		♅	216 39		VII
♀	121 31 to 122 44	V		♆	72 15 to 72 17		II
♂	123 42 to 124 19	V					

On comparing these current positions with the aspect positions in Schedule XXI, we find the following transits over bodies:—

☽ ☌ Asc. r
☽ △ ♂ r
☽ ☌ ♆ r
☿ □ ♀ r
☿ △ ♆ r
♀ △ Asc. r
♂ △ Asc. r
♂ ☌ ♂ r
♅ □ ♂ r
♆ ☌ ☉ r

New Moon was on June 14, 1893, when the longitude of Moon was 83° 21′, ☽ △ ♄ r. Full Moon was on June 29, 1893, when the longitude of Moon was 277° 40′, ☽ △ ♀ r.

Problem 60—Find all the transits over the radicals, relative to May 6, 1910, in George V's nativity.

The range of the current positions of bodies, from midnight to midnights on May 6, 1910, and their transits of houses were as follows:—

			Transits				Transits
☽	359° 12′ to 14° 0′	XII and I		♃	185° 41′ to 185° 36′		VII
☉	44 35 to 45 33	I		♄	28 38 to 28 46		I
☿	64 53 to 65 32	II		♅	295 13		XI
♀	358 52 to 359 54	XII		♆	106 57		IV
♂	92 34 to 93 11	IV					

On comparing these current positions with the aspect positions in Schedule XXI, we find the following transits over bodies :—

☽ □ ♅ r
☽ □ M.C. r
☽ ☍ ☽ r
☽ ☌ Asc. r
☽ △ ♂ r
☽ ☌ ♆ r
♀ □ ♅ r
♀ □ M.C. r
♂ □ Asc. r
♅ □ ♃ r

New Moon and Solar Eclipse was on May 9, 1910, when the longitude of Moon was 47° 42′, ☽ ☌ ☿ r. Full Moon and Lunar Eclipse was on May 24, 1910, when the longitude of Moon was 242° 10′, ☽ △ Asc. r.

Problem 61—Find all the transits over the radicals, relative to October 22, 1910, in George V's nativity.

The range of the current positions of bodies from midnight to midnight on October 22, 1910, and their transits of houses were as follows :—

		Transits			Transits
☽	75° 13′ to 89° 42′	III	♃	205° 33′ to 205° 46′	VII
☉	207 43 to 208 42	VII	♄	33 32 to 33 27	I
☿	193 48 to 195 25	VII	♅	291 27	XI
♀	198 48 to 200 3	VII	♆	111 34	IV
♂	199 39 to 200 18	VII			

On comparing these current positions with the aspect positions in Schedule XXI, we find the following transits over bodies :—

☽ △ ♄ r
☽ ☌ ♃ r
☽ ☍ ♅ r
☽ ☌ M.C. r
☉ △ ♅ r
☿ △ ☉ r
♃ ☍ ♄ r
♄ □ ☍ r

New Moon was on October 3, 1910, when the longitude of Moon was 189° 15′, ☽ ☌ ♆ r. Full Moon was on October 18, 1910, when the longitude of Moon was 24° 20′, ☽ ☌ ♄ r.

Now let us take the progressed bodies and their aspects on the three dates.

(i) July 6, 1893—the previous birth-date was June 3, 1893. Progressed date July 1, 1865. The equivalent moment of birth on July 1, 1865, was 1-23 a m. G.M.T.

The positions and their aspects at 1-23 a.m. G.M.T. on July 1, 1865, were as follows :—

	Conjunction	Square	Trine	Opposition
♆	10° 34′	100° 34′ 280 34	130° 34′ 250 34	190° 34′
♀	54 41	144 41 324 41	174 41 294 41	234 41
Asc.	59 6	149 6 329 6	179 6 299 6	239 6

	Conjunction	Square	Trine	Opposition
♅	90° 18′	180° 18′ 0 18	210° 18′ 330 18	270° 18′
☿	98 12	188 12 8 12	218 12 338 12	278 12
☉	99 10	189 10 9 10	219 10 339 10	279 10
♂	142 17	232 17 52 17	262 17 22 17	322 17
☽	189 1	279 1 99 1	309 1 69 1	9 1
♄	203 37	293 37 113 37	323 37 83 37	23 37
♃	262 10	352 10 172 10	22 10 142 10	82 10
M.C.	297 47	27 47 207 47	57 47 177 47	117 47

Now arranging these positions in their numerically increasing order, we get the following schedule :—

Schedule XXII—The Progressed bodies and Aspects for the 29th year.

Progressed position	Aspect
0° 18′	□ ♅
8 12	□ ☿
9 1	☌ ☽
9 10	□ ☉
10 34	☍ Ψ
22 10	△ ♃
22 17	△ ♂
23 37	☌ ♄
27 47	□ M.C.
52 17	□ ♂
54 41	☍ ♀
57 47	△ M.C.
59 6	☍ Asc.
69 1	△ ☽

Progressed position	Aspect
82° 10′	☌ ♃
83 37	△ ♄
90 18	☍ ♅
98 12	☍ ☿
99 1	□ ☽
99 10	☍ ☉
100 34	□ Ψ
113 37	□ ♄
117 47	☌ M.C.
130 34	△ Ψ
142 17	☌ ♀
142 10	☍ ♂
144 41	□ ♀
149 6	□ Asc.

Schedule XXII—The Progressed Bodies and Aspects for the 29th year—(Contd.)

Progressed position	Aspect	Progressed position	Aspect
188° 12′	□ ☿	262° 17′	△ ♂
189 1	♂ ☽	270 18	♂ ♅
189 10	□ ☉	278 12	♂ ☿
190 34	♂ ♆	279 1	□ ☽
203 37	♂ ♄	279 10	♂ ☉
207 47	□ M.C.	280 34	□ ♆
210 18	△ ♅	293 37	□ ♄
218 12	△ ☿	294 41	△ ♀
219 10	△ ☉	297 47	♂ M.C.
232 17	□ ♂	299 6	△ Asc.
234 41	△ ♃	309 1	△ ☽
239 6	♂ Asc.	322 17	♂ ♂
250 34	△ ♆	323 37	△ ♄
262 10	♂ ♃	324 41	□ ♀
172 10	□ ♃	329 6	□ Asc.
174 41	△ ♀	330 18	△ ♅
177 47	△ M.C.	338 12	△ ☿
179 6	△ Asc.	339 10	△ ☉
180 18	□ ♅	352 10	□ ♃

Problem 62—Find all the Transits over the progressed bodies, relative to July 6, 1893, in George V's nativity.

The range of the current positions of bodies, from midnight to midnight, on July 6, 1893, (see Problem 59) and the transits of houses were as follows :—

				Transits					Transits
☽	2° 35′	to	16° 6′	XII	♃	53° 17′	to	53° 30′	XII
☉	104 6	to	105 3	III	♄	186 40	to	186 42	VI
☿	129 52	to	131 3	IV	♅	216 39			VI
♀	121 31	to	122 44	IV	♆	72 15	to	72 17	I
♂	123 42	to	124 19	IV					

On comparing the current positions with the aspect positions in Schedule XXII, we find the following transits over progressed bodies :—

☽ □ ☿ p
☽ ☌ ☽ p
☽ □ ☉ p
☽ ♂ ♆ p
☿ △ ♆ p
♃ □ ♂ p
♄ □ ☿ p
♅ △ ☿ p
♆ △ ☽ p

For New and Full Moons see under Problem 59.

(ii) May 6, 1910 —the previous birth-date was June 3, 1909. The Progressed date was July 17, 1865, and the equivalent moment of birth was 1-26 a.m. G.M.T.

The positions and their aspects at 1-26 a.m. G.M.T. on July 17, 1865 were as follows :—

	Conjunction	Square	Trine	Opposition
♆	10° 35′	100° 35′ 280 35	130° 35′ 250 35	190° 35′
☽	42 24	132 24 312 24	162 24 282 24	222 24
♀	68 48	158 48 338 48	188 48 308 48	248 48
Asc.	79 25	169 25 349 25	199 25 319 25	259 25
♅	91 18	181 18 1 18	211 18 331 18	271 18
☉	114 25	204 25 24 25	234 25 354 25	294 25
☿	130 34	220 34 40 34	250 34 10 34	310 34
♂	152 6	242 6 62 6	272 6 32 6	332 6
♄	203 55	293 55 113 55	323 55 83 55	23 55
♃	260 32	350 32 170 32	20 32 140 32	80 32
M.C.	313 55	43 55 223 55	73 55 193 55	133 55

Now arranging these positions in their increasing numerical order, we get the following schedule :—

Schedule XXIII—The Progressed bodies and aspects for the 45th year.

Progressed position	Aspect	Progressed position	Aspect
1° 18′	□ ♅	193° 55′	△ M.C.
10 34	△ ☿	199 25	△ Asc.
10 35	☌ ♆	203 55	☌ ♄
20 32	△ ♃	204 25	□ ☉
23 55	☍ ♄	211 18	△ ♅
24 25	□ ☉	220 34	□ ☿
32 6	△ ♂	222 24	☍ ☽
40 34	□ ☿	223 55	□ M.C.
42 24	☌ ☽	234 25	△ ☉
53 55	□ M.C.	242 6	□ ♂
62 6	□ ♂	248 48	☍ ♀
68 48	☌ ♀	250 34	△ ☿
73 55	△ M.C.	250 35	△ ♆
79 25	☌ Asc.	259 25	☍ Asc.
80° 32′	☍ ♃	260 32	☌ ♃
83 55	△ ♄	271 18	☍ ♅
91 18	☌ ♅	272 6	△ ♂
100 35	□ ♆	280 35	□ ♆
113 55	□ ♄	282 24	△ ☽
114 25	☌ ☉	293 55	□ ♄
130 34	☌ ☿	294 25	☍ ☉
130 35	△ ♆	308 48	△ ♀
132 24	□ ☽	310 34	☍ ☿
133 55	☍ M.C.	312 24	□ ☽
140 32	△ ♃	313 55	☌ M.C.
152 6	☌ ♂	319 25	△ Asc.
158 48	□ ♀	323 55	△ ♄
162 24	△ ☽	331 18	△ ♅
169 25	□ Asc.	332 6	☍ ♂
170 32	□ ♃	338 48	□ ♀
181 18	□ ♅	349 25	□ Asc.
188 48	△ ♀	350 32	□ ♃
190 35	☍ ♆	354 25	△ ☉

Problem 63—Find all Transits over Progressed bodies, relative to May 6, 1910, in George V's nativity.

The range of the current positions of bodies from midnight to midnight on May 6, 1910 (Problem 60) and Transits over houses were as follows :—

		Transits			Transits
☽	359° 12′ to 14° 0′	XI Prog.	♃	185° 41′ to 185° 36′	V Prog.
☉	44 35 to 45 33	XII	♄	28 38 to 28 46	XII
☿	64 53 to 65 32	XII	♅	295 13	IX
♀	358 52 to 359 54	XI	♆	106 57	II
♂	92 34 to 93 11	I			

On comparing these current positions with the aspect positions in Schedule XXIII we find the following transits over bodies :—

☽ □ ♅ p
☽ △ ☿ p
☽ ☌ ♆ p
☉ □ M.C. p
♂ ☌ ♅ p
♅ ☍ ☉ p

For New and Full Moons see under Problem 60.

(iii) October 22, 1910.—The previous birth-date was June 3, 1910. The Progressed date was July 18, 1865, and the equivalent moment of birth was 1-26 a.m. G.M.T.

The positions and aspects at 1-26 a.m. G.M.T., on July 18, 1865, were as follows :—

	Conjunction	Square	Trine	Opposition
♆	10° 35′	100° 35′ 280 35	130° 35′ 250 35	190° 35′
☽	56 19	146 19 326 19	176 19 296 19	236 19
♀	69 45	159 45 339 45	189 45 309 45	249 45
Asc.	80 26	170 26 350 26	200 26 320 26	260 26
♅	91 21	181 21 1 21	211 21 331 21	271 21
☉	115 22	205 22 25 22	235 22 355 22	295 22
☿	132 20	222 20 42 20	252 20 12 20	312 20
♂	152 43	242 43 62 43	272 43 32 43	332 43
♄	203 56	293 56 113 56	323 56 83 56	23 56
♃	260 27	350 27 170 27	20 27 140 27	80 27
M.C.	314 54	44 54 224 54	74 54 194 54	134 54

Now arranging these positions in their increasing numerical order, we get the following schedule:—

Schedule XXIV—The Progressed bodies and their aspects for the 46th year.

Progressed position	Aspect	Progressed position	Aspect
1° 21′	□ ♅	194° 54′	△ M.C.
10 35	☌ ♆	200 26	☌ Asc.
12 20	△ ♃	203 56	☌ ♄
20 27	△ ♃	205 22	□ ☉
23 56	☍ ♄	211 21	△ ♅
25 22	□ ☉	222 20	□ ♃
32 43	△ ☌	224 54	□ M.C.
42 20	□ ♃	235 22	△ ☉
44 54	□ M.C.	236 19	☍ ☽
56 19	☌ ☽	242 43	□ ☌
62 43	□ ☌	249 45	☍ ♀
69 45	☌ ♀	250 35	△ ♆
74 54	△ M.C.	252 20	△ ♃
80 26	☌ Asc.	260 26	☍ Asc.
80 27	☍ ♃	260 27	☌ ♃
83 56	△ ♄	271 21	☍ ♅
91 21	☌ ♅	272 43	△ ☌
100 35	□ ♆	280 35	□ ♆
113 56	□ ♄	293 56	□ ♄
115 22	☌ ☉	295 22	☍ ☉
130 35	△ ♆	296 19	△ ☽
132 20	☌ ☌	309 45	△ ♀
134 54	☍ M.C.	312 20	☍ ♃
140 27	△ ♃	314 54	☌ M.C.
146 19	□ ☽	320 26	△ Asc.
152 43	☌ ☌	323 56	△ ♄
159 45	□ ♀	326 19	□ ☽
170 26	□ Asc.	331 21	△ ♅
170 27	□ ♃	332 43	☍ ☌
176 19	△ ☽	339 45	□ ♀
181 21	□ ♅	350 26	□ Asc.
189 45	△ ♀	350 27	□ ♃
190 35	☍ ♆	355 22	△ ☉

Problem 64—Find all the Transits over progressed bodies, relative to October 22, 1910 in George V's nativity.

The range of the current positions of bodies from mid-night to mid-night on October 22, 1910 (Problem 61) and Transits our houses were as follows :—

		Transits			Transits
☽	75° 13′ to 89° 42′	XII & I Prog.	♃	205° 33′ to 205° 46′	V Prog.
☉	207 43 to 208 42	V	♄	33 32 to 33 27	XII
☿	193 48 to 195 25	V	♅	291 27	VIII
♀	198 48 to 200 3	V	♆	111 34	II
♂	199 39 to 200 18	V			

On comparing the current positions with the aspect positions in Schedule XXIV, we find the following transits our bodies.

☽ △ M.C. p
☽ ☌ Asc. p
☽ ☍ ♃ p
☽ △ ♄ p
☿ △ M.C. p
♀ △ Asc. p
♂ △ Asc. p
♃ □ ☉ p
♄ △ ♂ p

For New and Full Moons see under Problem 61.

Schedule XXV—Recapitulation of the characteristic features of each class of Directions and Aspects.

Directions or Aspects	The Moment for Casting the horoscope	Nature of Aspects	Bodies in Aspect	When Directions or Aspects bear fruit	Is there an arc of direction?	Is there an orb?
Radical Aspects	The moment of birth	Zod. & Mund.	Radicals	Whole life	No	Yes
Primary Direction	The moment of birth	Mundane (and Zodiacal)	Radicals and bodies soon after birth	During the year measured to by the arc of direction	Yes	No
Secondary Direction	The equivalent moment of birth on the same ordinal date subsequent to birth as the ordinal number of year of life	Zodiacal	Progressed bodies at the moment and Radicals or other Progressed bodies at the moment	During the ordinal year corresponding to the ordinal number of day from birth on the Progressed date	Yes	No
Synodic Lunation	The moment when Moon was at the same distance from the Sun as at birth, for the same number of time as the ordinal number of year of life containing the given date	Zodiacal	Bodies at the moment	During the ordinal year of life corresponding to the ordinal number of the lunation from birth	No	Yes
Solar Return	The moment just before the given date when the Sun was at the same longitude as at birth	Zodiacal	Bodies at the moment	During the whole year succeeding the moment	No	Yes
Current Synodic Lunation	The moment just before the given date when Moon was at the same distance from the Sun as at birth	Zodiacal	Bodies at the moment	During the whole synodic month succeeding the moment	No	No
Lunar Return	The moment just before the given date when Moon was at the same longitude as at birth	Zodiacal	Bodies at the moment	During the whole lunar month succeeding the moment	No	No
Daily Map	The equivalent moment of birth on the given date	Zodiacal	Bodies at the moment	During the whole day	No	No
Transit	The Greenwich mean-midnights both at the beginning and at the end of the given period	Zodiacal	Radicals or Progressed, and Bodies during the period	During the period of Transit	No	Yes

89. Comparative Study of Aspects and Directions—Let us take the three most important dates in George V's life, namely, July 6, 1893, May 6, 1910 and October 22, 1910, and see what are the several aspects, directions and transits that have had a bearing on his life on the dates. We have to note the aspects, directions and transits relative to these different dates under the following heads :—

(i) All the Radical Zodiacal Aspects.

(ii) All the Radical Mundane Aspects.

(iii) All the Primary Mundane Directions relative to the 29th, the 45th and the 46th year.

(iv) All the Secondary directions of the progressed to the radicals, and of the progressed to the other progressed bodies, relative to the three years.

(v) The Epochal Aspects at the Solar Returns at the beginnings of the three years.

(vi) All Transits over the radicals and the progressed bodies during the three days.

Though the arcs of primary mundane directions are strictly speaking only about 28° 5′, 44° 55′ and 45° 20′, yet we shall take into consideration also directions whose arcs are half of a degree more or less. In the case of secondary directions we shall take directions whose arcs measure to six months before and after the dates.

Radical Aspects in George V's nativity

Zodiacal	Mundane
☽ S □ ♅	☽ A □ ♅
S □ ♃	S □ ♃
A Bq ♀	S ☍ ♀
A ☌ ♂	S ☌ ♂
A ☐ ☿	A Bq ☿
S ‖ ♆	A △ ☉
	A ‖ ♆
☿ A Bq. ♃	☿ A ☌ ♆
S ‖ ♀	S ✶ ♅
	A ☐ ♃
♀ A ☌ ♆	A ‖ ♂
A ☐ ♃	♀ S ♂ ♄
	A ✶ ♅
☉ S ✶ ♆	S △ ♃
A △ ♄	☉ A ✶ ♆
S ☌ ♀	A △ ♄
S ✶ ♂	A ☐ ♄
A ‖ ♅	S ☌ ♅
A ‖ ♃	S ☌ ♀
	S □ ♂
♂ A △ ♆	♂ S ☐ ♆
A □ ♀	A ∠ ♄
A ‖ ☉	S ✶ ♄
	A ✶ ♅
♃ A ✶ ♄	S △ ♃
S ♂ ♅	A △ ♀
A ‖ ♅	♃ A ✶ ♄
	S ♂ ♅
♅ S △ ♄	♅ S △ ♄

Directions, Aspects and Transits relative to July 6, 1893, in George V's nativity, i.e., for the 29th year

Primary Directions — Mundane

☽	□	☉	27° 11′
♆	∠	♀	27 11
	Bq.	♄	27 17
☿	☌	♅	27 41
	□	M.C.	27 41
	Bq.	♂	27 44
	✳	☉	27 57
♂	☍	☽	27 46
	∠	☉	27 50
♅	∠	♅	28 24
	☐	☽	28 36

Secondary Directions — To the Radicals

☽	⚻	♀	June 93
	☌	♆	July 93
♀	Bq.	M.C.	June 93

Secondary Directions — To the Progressed

☽	☐	♀	June 93
	□	☉	June 93
	☍	♃	July 93
	☌	♆	July 93

Aspects at the Solar Return

☽	A	☍	♅
	S	□	♄
	S	△	♃
	S	☌	♂
	A	Bq.	☉
	S	Bq.	☿
	S	Bq.	♆
☿	A	☌	♆
	S	⚻	♅
	S	△	♄
	A	☌	☉
		‖	☉
		‖	♀
		‖	♂
♀	A	☐	♅
		‖	♂
		‖	☉
☉	S	☌	♆
	S	Bq.	♅
	S	△	♄
	S	⚺	♂
		‖	♂
♂	S	⚺	♆
	S	△	♅
	S	□	♄
	A	✳	♃
♃		‖	♆
♅	A	⚺	♄
♆	S	△	♄

Transits — Over the Rad.

				House
☽	☌	Asc.	r	
	☌	♆	r	
	□	♂	r	
				XII, I
☿	△	♆	r	
	□	♀	r	
				V
☿	△	☌	r	
♀	△	Asc.	r	
				V
				IV
☉	△	Asc.	r	
♂	☌	☉	r	
				V
♃				II
♄				VII
♅	□	♂	r	
				VII
♆	☌	☉	r	
				II

Transits — Over the Prog.

				House
☽	☌	♆	p	
	☍	☽	p	
	□	☿	p	
	□	☉	p	
				XII
☿	△	♆	p	
				IV
♀				IV
☉				III
♂				IV
♃	□	♂	p	
				XII
♄	□	☿	p	
♅	△	☿	p	
				VI
♆	△	☽	p	
				I

New Moons Full Moons & Eclipses

New Moon June 14, 1893, with Moon at 83° 21′, and ☽ △ ♄ r

Full Moon June 29, 1893, with Moon at 277° 40′, and ☽ △ ♀ r

Directions, Aspects and Transits relative to May 6, 1910, in George V's nativity, i.e., to the 45th year

Primary Directions

Mundane

☉	□	♅	44°	17′
	☌	☽	44	43
♀	∠	♀	44	18
	Bq.	♄	44	25
♂	∠	☿	44	33
♅	☌	♄	44	49
♆	Q	☿	44	18

Secondary Directions

To the Radicals

☽	Q	♂	Mar. 10
	∠	♆	Apr. 10
	Bq.	M.C.	Apr. 10
	☍	♄	Apr. 10
	☍	♃	May 10
☿	Q	h	Apr. 10
	✶	☉	June 10
♀	⚺	♀	Apr. 10

To the Progressed

☽	☍	♃	Jan. 10
	∠	♆	May 10
	☍	♄	May 10
	✶	☉	May 10
☿	Q	♄	Apr. 10

Aspects at the Solar Return

☽	A	Bq.	♆
	S	∠	♅
	S	△	♄
	S	□	♃
	A	☌	☉
	S	□	☌
		‖	♅
		‖	☉
		‖	☌
	☿	‖	♅
		‖	☌
♀	S	⚺	♅
	S	✶	♄
	A	☌	☿
		‖	☉
		‖	☌
		‖	☿
		‖	♅
☉	A	Bq.	♅
	A	✶	♄
	S	□	♃
	S	□	☌
		‖	♅
		‖	☿
		‖	☌
☌	A	∠	♅
	S	∠	♄
	A	☌	♃
	S	△	☿
		‖	♃
♃	S	□	♅
	S	□	♄
♄	S	□	♆
	A	□	♅
♆	A	☌	♅
		‖	♅

Transits

Over the Rad.

				House
☽	□	♅	r	
	□	M.C.	r	
	☌	☽	r	
	△	☌	r	
	☌	♆	r	
				XII, I
☿				II
♀	□	♅	r	
	□	M.C.	r	
				XII
☉				I
☌	□	Asc.	r	
				IV
♃				VII
♄				I
♅	□	♃	r	
				XI
♆				IV

Over the Prog.

				House
☽	□	♅	p	
	△	☿	p	
	☌	♆	p	
				XI
☿				XII
♀				XI
☉	□	M.C.	p	
				XII
☌	☌	♅	p	
				I
♃				V
♄				XII
♅	☌	☉	p	
				IX
♆				II

New Moons Full Moons & Eclipses

New Moon and Solar eclipse, May 9, 1910 with Moon at 47° 42′, and ☽ ☌ ☿ r

Full Moon and Lunar eclipse May, 24, 1910 with Moon at 242° 10′, and ☽ △ Asc. r

Directions, Aspects and Transits relative to October 22, 1910, in George V's nativity, i.e., to the 46th year

Primary Directions

Mundane

☽	☌	☉	45°	51′
☿	☍	♄	45	28
♂	☌	♆	45	50
♅	∠	☉	45	9
	☌	♅	45	26
♆	✶	♃	45	48

Secondary Directions

To the Radicals

☽	☋	♅	Aug. 10
	☍	M.C.	Sep. 10
	Bq.	♄	Sep. 10
	△	☽	Oct. 10
	✶	Asc.	Nov. 10
☉	☍	♃	Sep. 10
♀	✶	♆	Nov. 10

To the Progressed

☽	Bq.	♄	Sep. 10
	☋	♅	Oct. 10
	☌	☿	Oct. 10
	□	♂	Nov. 10

Aspects at the Solar Return

☽	S	□	♆
	A	□	♅
	S	□	♂
☿	A	△	♅
	S	☋	♄
♀	S	△	♃
	A	♂	♄
	S	□	♅
	S	☋	☿
	S	∠	☉
	S	□	♂
		‖	♄
☉	S	□	♅
	S	△	♃
	S	♂	☿
		‖	♆
		‖	♅
		‖	♂
♂	S	♂	♆
	A	☌	♅
		‖	♅
		‖	♆
♄	S	□	♅
♆		‖	♅

Transits

Over the Rad.

					House
☽	☌	♅	r		
	△	♄	r		
	☌	♃	r		
	☌	M.C.	r		
					III
☿	△	☉	r		
					VII
♀					VII
☉	△	♅	r		
					VII
♂					VII
♃	☌	♄	r		
					VII
♄	□	♂	r		
					I
♅					XI
♆					IV

Over the Prog.

				House
☽	△	♄	p	
	☌	♃	p	
	△	M.C.	p	
	☌	Asc.	p	
				XII, I
☿	△	M.C.	p	V
♀	△	Asc.	p	
				V
☉				V
♂	△	Asc.	p	
				V
♃	△	☉	p	
				V
♄	△	♂	p	
				XII
♅				VIII
♆				II

New Moons Full Moons & Eclipses

New Moon, October 3, 1910, with Moon at 189° 15′, and ☽ ☌ ♆ r

Full Moon, October 18, 1910, with Moon at 24° 20′, and ☽ ☌ ♄ r

End

ANSWERS

LESSON I [Pages 1 to 10]

Ex. 1 [Page 1]

	Long.			Lat.
☉	260° 43′ 23″	... ...		0° 0′ 0″
☽	274 30 13	... ...		1 10 11 S
☿	280 42	... ...		2 5 S
♀	214 3	... ...		2 39 N
♂	297 22	... ...		1 15 S
♃	118 47	... ...		0 21 N
♄	279 47	... ...		0 26 N
♅	120 42	... ...		0 35 N
♆	21 22	... ...		1 35 S

Ex. 2 [Page 2]

X	213°	52′·1
XI	242	3 ·8
XII	267	58 ·9
I	294	34 ·2
II	327	30 ·0
III	1	49 ·8

Ex. 4 [Page 3]

Mundane Position

	By M. D.			By C. D. F.
♂	91° L 55′·2	...	...	I 3° 24′·4
♆	11 L 12 ·9	...	...	III 18 15 ·9
♃	90 U 37 ·0	...	...	VII 4 23 ·9
♅	88 U 34 ·6	...	...	VII 6 23 ·4
♀	1 U 5 ·4	...	...	X 1 5 ·4
☉	48 U 16 ·8	...	...	XI 20 9 ·9
☽	63 U 19 ·6	...	...	XII 7 19 ·8
♄	68 U 59 ·0	...	...	XII 12 40 ·0
☿	70 U 11 ·2	...	...	XII 14 19 ·1

Ex. 6 [Page 3]

Body.	C. Long.	C. Lat.	R. A.	Decl.	M. D.	S. A.	H. S.	H. D.	C. D.
♂	297° 22′	1 S 15	299° 42′	21 S 56	91 L 55·2	95 N 19·5	31 N 46·5	3 E 24·4	i 3 F 24·4
									ii 28 B 22·1
♆	21 22	1 S 35	20 25	6 N 44	11 L 12·9	88 N 26·3	29 N 28·8	77 E 13·5	iii 18 F 15·9
									iv 11 B 12·9
♃	118 47	0 N 21	121 0	20 N 45	90 U 37·0	95 D 0·8	31 D 40·3	4 W 23·9	vii 4 F 23·9
									viii 27 B 16·4
♅	120 42	0 N 35	123 3	20 N 35	88 U 34·6	94 D 58·0	31 D 39·3	6 W 23·4	vii 6 F 23·4
									viii 25 B 15·9
♀	214 3	2 N 39	212 43	10 S 22	1 U 5·4	87 D 35·0	29 D 11·7	88 W 40·4	x 1 F 5·4
									xi 28 B 6·3
☉	260 43	0 0	259 54	23 S 8	48 U 16·8	84 D 20·9	28 D 7·0	132 W 37·7	xi 20 F 9·9
									xii 7 B 57·1
☽	274 30	1 S 10	274 57	24 S 33	63 U 19·6	83 D 57·2	27 D 59·1	147 W 15.1	xii 7 F 19·8
									i 20 B 39·3
♄	279 47	0 N 26	280 36	22 S 40	68 U 59·0	84 D 28·5	28 D 9·5	153 W 27·6	xii 12 F 40·0
									i 15 B 29·5
☿	280 42	2 S 5	281 49	25 S 6	70 U 11·2	83 D 48·1	27 D 56·0	153 W 59·3	xii 14 F 19·1
									i 13 B 36·9
M.C.	213 52	0 0	211 37	12 S 49	—	—	—	—	—
Asc.	294 34	0 0	296 29	21 S 13	—	—	—	—	—

Ex. 7 [Page 5]

☽ S ☌ ♅
A ☍ ♄
S ✶ ♀
A ☍ ☿
☿ S ☍ ♄
S ✶ ♀

♀ S □ ♅
S □ ♃
A ✶ ♄
S □ ♂
A ∠ ☉
☉ A △ ♆

☉ A Bq. ♃
♂ S □ ♆
A ☌ ♅
A ☌ ♃
♃ S ☍ ♅

☽ S ‖ ♄
S ‖ ☉
A ‖ ☿
☿ S ‖ ☉
☉ S ‖ ♄

♂ A ‖ ♄
S ‖ ♅
S ‖ ♃
A ‖ ☉
♃ A ‖ ♄
S ‖ ♅

Ex. 8 [Page 5]

☽ S ☌ ♅
S ☌ ♃
S ✶ ♀
A ☍ ♄
A ☍ ☿

☉ S △ ♆
S △ ♃
S △ ♅
S ∠ ♂
♃ S ☍ ♅

♀ A □ ♅
A □ ♃
A ⚹ ♄
A □ ♂
♄ A □ ♆

☿ S ☍ ♄
S ⚹ ♀
A □ ♆
♂ A ☌ ♅
A ☌ ♃

No Parallels

Ex. 9 [Page 29]

C. D. B. & C. D. F. of S. P. Mod. to S. A. of D. B. at Birth

D.B.

S.P.		☿		♄		☽		☉		♀		♂		♃		♅		♆	
☿	F	13	36'9	13	43'5	13	38'4	13	42'2	14	13'8	15	25'7	15	26'2	14	22'1	15	29'3
	B	**14**	**19'1**	**14**	**26'0**	**14**	**20'6**	**14**	**24'7**	**14**	**57'9**	**16**	**13'6**	**16**	**14'0**	**15**	**6'6**	**16**	**17'2**
♄	F	15	22'1	15	29'5	15	23'8	15	28'1	16	3'7	17	25'0	17	25'5	16	13'1	17	28'9
	B	**12**	**33'9**	**12**	**40'0**	**12**	**35'3**	**12**	**38'8**	**13**	**7'9**	**14**	**14'4**	**14**	**14'8**	**13**	**15'7**	**14**	**17'6**
☽	F	20	37'1	20	47'0	20	39'3	20	45'1	21	32'9	23	21'9	23	22'6	21	45'5	23	27'2
	B	**7**	**19'0**	**7**	**22'6**	**7**	**19'8**	**7**	**21'9**	**7**	**38'8**	**8**	**17'5**	**8**	**17'8**	**7**	**43'3**	**8**	**19'3**
☉	F	7	54'0	7	57'8	7	54'9	7	57'1	8	15'4	8	57'2	8	57'4	8	20'2	8	59'2
	B	**20**	**2'1**	**20**	**11'7**	**20**	**4'3**	**20**	**9.9**	**20**	**56'3**	**22**	**42'2**	**22**	**42'9**	**21**	**8'6**	**22**	**47'4**
♀	F	26	53'5	27	6'5	26	56'4	27	4'0	28	6'3	30	28'5	30	29'3	28	22'8	30	35'4
	B	**1**	**2'6**	**1**	**3'1**	**1**	**2'7**	**1**	**3'0**	**1**	**5'4**	**1**	**10'9**	**1**	**10'9**	**1**	**6'0**	**1**	**11'2**
♃	F	22	17'7	22	28'4	22	20'1	22	26'4	23	18'1	25	15'9	25	16'6	23	31'7	25	21'6
	B	**5**	**38'3**	**5**	**41'0**	**5**	**38'9**	**5**	**40'6**	**5**	**53'6**	**6**	**23'4**	**6**	**23'6**	**5**	**57'0**	**6**	**24'8**
♅	F	24	3'3	24	14'9	24	5'9	24	12'7	25	8'4	27	15'6	27	16'4	25	23'1	27	21'8
	B	**3**	**52'6**	**3**	**54'6**	**3**	**53'1**	**3**	**54'3**	**4**	**3'3**	**4**	**23'8**	**4**	**23.9**	**4**	**5'6**	**4**	**24'8**
♆	F	10	37'6	10	42'8	10	38'8	10	41'8	11	6'4	12	2'6	12	2'9	11	12'9	12	5'3
	B	**17**	**18'5**	**17**	**26'8**	**17**	**20'3**	**17**	**25'2**	**18**	**5'3**	**19**	**36'8**	**19**	**37'4**	**18**	**15'9**	**19**	**41'3**
♂	F	24	56'3	25	8'4	24	59'1	25	6'1	26	3'9	28	15'7	28	16'5	26	19'1	28	22'1
	B	**2**	**59'6**	**3**	**1'1**	**3**	**0'0**	**3**	**0'8**	**3**	**7'8**	**3**	**23'6**	**3**	**23'7**	**3**	**9'6**	**3**	**24'4**

From	To M.C.	☿	☉	☽	♄	♅	Asc.	♂	♆	♃	♇
☿	0 1° 5′	0 0° 0′	**i 19° 51′**	**ii 6° 33′**	**ii 12° 3′**	**ii 13° 53′**	**ii 28° 7′**	**iii 2° 2′**	**v 17° 0′**	**ii 26° 14′**	**ii 24° 24′**
☉	i 20 10	i 19 7	0 0 0	**0 15 19**	**0 20 36**	**0 22 22**	**i 7 57**	**i 10 58**	**iii 25 22**	**iv 16 16**	**iv 14 26**
☽	ii 7 20	ii 6 17	0 15 15	0 0 0	**0 5 16**	**0 7 1**	**0 20 39**	**0 28 39**	**iii 10 1**	v 3 27	v 1 41
♄	ii 12 40	ii 11 37	0 20 38	0 5 18	0 0 0	**0 1 46**	**0 15 30**	**0 18 31**	**iii 4 47**	v 8 45	v 6 59
♅	ii 14 19	ii 13 17	0 22 13	0 7 0	0 1 45	0 0 0	**0 13 37**	**0 16 37**	**iii 2 59**	v 10 26	v 8 41
♂	iii 3 24	iii 2 13	i 12 24	0 26 52	0 20 53	0 18 54	0 3 24	0 0 0	**ii 16 17**	v 30 46	v 28 46
♆	v 18 16	v 17 10	iii 26 36	iii 10 33	iii 5 0	iii 3 9	ii 18 16	ii 15 0	0 0 0	**iii 15 19**	**iii 17 10**
♃	**ii 27 16**	**ii 28 27**	**iv 18 19**	**v 3 54**	**v 9 51**	**v 11 50**	**v 27 16**	**v 30 40**	iii 16 27	0 0 0	**0 2 0**
♇	**ii 25 16**	**ii 26 27**	**iv 16 19**	**v 1 54**	**v 7 51**	**v 9 50**	**v 25 16**	**v 28 40**	iii 18 26	0 2 0	0 0 0

N.B.—Figures in thick types are those obtained by rectification.

Ex. 11 [Page 29]

Noct. A.	E. ♂	Diff	Aspect	Diur. A.	E. ♂	Diff
	0 0°0		☌		0 0°0	
		31 46'5				28 13'5
i	0 0°0		☍	i	0 0°0	
		6 21'3				5 38'7
	6 21'3		⊥		5 38'7	
		9 32'0				8 28'0
	15 53'3		∠		14 6'7	
		15 53'2				14 6'8
ii	0 0°0		✶	ii	0 0°0	
		12 42'6				11 17'4
	12 42'6		☌		11 17'4	
		19 3'9				16 56'1
iii	0 0°0		□	iii	0 0°0	
		31 46'5				28 13'5
iv	0 0°0		△	iv	0 0°0	
		15 53'3				14 6'7
	15 53'3		☍		14 6'7	
		9 31'9				8 28'1
	25 25'2		±		22 34'8	
		6 21'3				5 38'9
v	0 0°0		∓	v	0 0°0	
		31 46'5				28 13'5
vi	0 0°0		☌	vi	0 0°0	

Noct. A.	E. ☿	Diff	Aspect	Diur. A.	E. ☿	Diff
	0 0°0		☌		0 0°0	
		29 28'8				30 31'2
i	0 0°0		☍	i	0 0°0	
		5 53'8				6 6'2
	5 53'8		⊥		6 6'2	
		8 50'5				9 9'5
	14 44'3		∠		15 15'7	
		14 44'4				15 15'6
ii	0 0°0		✶	ii	0 0°0	
		11 47'6				12 12'4
	11 47'6		☌		12 12'4	
		17 41'2				18 18'8
iii	0 0°0		□	iii	0 0°0	
		29 28'7				30 31'3
iv	0 0°0		△	iv	0 0°0	
		14 44'4				15 15'6
	14 44'4		☍		15 15'6	
		8 50'6				9 9'4
	23 35'0		±		24 25'0	
		5 53'8				6 6'2
v	0 0°0		∓	v	0 0°0	
		29 28'8				30 31'2
vi	0 0°0		☌	vi	0 0°0	

Diur. A. E. ♃		Diff	Aspect	Noct. A. E. ♃		Diff
0	0		☌	0	0	
		31 40·3				28 19·7
i 0	0		⚺	i 0	0	
		6 20·1				5 39·9
6	20·1		⊥	5	39·9	
		9 30·1				8 29·9
15	50·2		∠	14	9·8	
		15 50·1				14 9·9
ii 0	0		✶	ii 0	0	
		12 40·1				11 19·9
12	40·1		☌	11	19·9	
		19 0·1				16 59·9
iii 0	0		□	iii 0	0	
		31 40·3				28 19·7
iv 0	0		△	iv 0	0	
		15 50·1				14 9·9
15	50·1		☍	14	9·9	
		9 30·1				8 29·9
25	20·2		⚻	22	39·8	
		6 20·0				5 40·0
v 0	0		⚼	v 0	0	
		31 40·3				28 19·7
vi 0	0		☌	vi 0	0	

Diur. A. E. ♅		Diff	Aspect	Noct. A. E. ♅		Diff
0	0		☌	0	0	
		31 39·3				28 20·7
i 0	0		⚺	i 0	0	
		6 19·9				5 40·1
6	19·9		⊥	5	40·1	
		9 29·8				8 30·2
15	49·7		∠	14	10·3	
		15 49·7				14 10·3
ii 0	0		✶	ii 0	0	
		12 39·7				11 20·3
12	39·7		☌	11	20·3	
		18 59·6				17 0·4
iii 0	0		□	iii 0	0	
		31 39·3				28 20·7
iv 0	0		△	iv 0	0	
		15 49·7				14 10·3
15	49·7		☍	14	10·3	
		9 29·8				8 30·2
25	19·5		⚻	22	40·5	
		6 19·9				5 40·1
v 0	0		⚼	v 0	0	
		31 39·3				28 20·7
vi 0	0		☌	vi 0	0	

Diur. A. E. ♀		Diff	Aspect	Noct. A. E. ♀		Diff
0	0		☌	0	0	
		29 11·7				30 48·3
i 0	0		☍	i 0	0	
		5 50·3				6 9·7
5	50·3		⊥	6	9·7	
		8 45·5				9 14·5
14	35·8		∠	15	24·2	
		14 35·8				15 24·2
ii 0	0		✶	ii 0	0	
		11 40·7				12 19·3
11	40·7		☌	12	19·3	
		17 31·0				18 29·0
iii 0	0		□	iii 0	0	
		29 11·6				30 48·4
iv 0	0		△	iv 0	0	
		14 35·8				15 24·2
14	35·8		☍	15	24·2	
		8 45·5				9 14·5
23	21·3		±	24	38·7	
		5 50·3				6 9·7
v 0	0		∓	v 0	0	
		29 11·7				30 48·3
vi 0	0		☌	vi 0	0	

Diur. A. E. ☉		Diff	Aspect	Noct. A. E. ☉		Diff
0	0		☌	0	0	
		28 7·0				31 53·0
i 0	0		☍	i 0	0	
		5 37·3				6 22·7
5	37·3		⊥	6	22·7	
		8 26·1				9 33·9
14	3·4		∠	15	56·6	
		14 3·5				15 56·5
ii 0	0		✶	ii 0	0	
		11 14·8				12 45·2
11	14·8		☌	12	45·2	
		16 52·1				19 7·9
iii 0	0		□	iii 0	0	
		28 7·0				31 53·0
iv 0	0		△	iv 0	0	
		14 3·5				15 56·5
14	3·5		☍	15	56·5	
		8 26·1				9 33·9
22	29·6		±	25	30·4	
		5 37·3				6 22·7
v 0	0		∓	v 0	0	
		28 7·0				31 53·0
vi 0	0		☌	vi 0	0	

Diur. A. E. ☽			Diff	Aspect	Noct. A. E. ☽			Diff
	0	0		☌		0	0	
			27 59·1					32 0·9
i	0	0		⚺	i	0	0	
			5 35·2					6 24·2
	5	35·8		⊥				
			8 23·7			6	24·2	9 36·3
	13	59·5		∠				
			13 59·6			16	0·5	16 0·4
ii	0	0		✶	ii	0	0	
			11 11·6					12 48·4
	11	11·6		☌		12	48·4	
			16 47·4					19 12·6
iii	0	0		□	iii	0	0	
			27 59·1					32 0·9
iv	0	0		△	iv	0	0	
			13 59·6					16 0·4
	13	59·6		☍		16	0·4	
			8 23·7					9 36·3
	22	23·3		⚻		25	36·7	
			5 35·8					6 24·2
v	0	0		⚼	v	0	0	
			27 59·1					32 0·9
vi	0	0		☌	vi	0	0	

Diur. A. E. ♄			Diff	Aspect	Noct. A. E. ♄			Diff
	0	0		☌		0	0	
			28 9·5					31 50·5
i	0	0		⚺	i	0	0	
			5 37·9					6 22·1
	5	37·9		⊥				
			8 26·9			6	22·1	9 33·1
	14	4·8		∠				
			14 4·7			15	55·2	15 55·3
ii	0	0		✶	ii	0	0	
			11 15·8					12 44·2
	11	15·8		☍		12	44·2	
			16 53·7					19 6·3
iii	0	0		□	iii	0	0	
			28 9·5					31 50·5
iv	0	0		△	iv	0	0	
			14 4·7					15 55·3
	14	4·7		☍		15	55·3	
			8 26·9					9 33·1
	22	31·6		⚻		25	28·4	
			5 37·9					6 22·1
v	0	0		⚼	v	0	0	
			28 9·5					31 50·5
vi	0	0		☌	vi	0	0	

Diur.	A.	E. ☿	Diff	Aspect	Noct.	A.	E. ☿	Diff
	0	0		☌		0	0	
			27 56·0					32 4·0
i	0	0		☍	i	0	0	
			5 35·2					6 24·8
	5	35·2		⊥		6	24·8	
			8 22·8					9 37·2
	13	58·0		∠		16	2·0	
			13 58·0					16 2·0
ii	0	0		✶	ii	0	0	
			11 10·4					12 49·6
	11	10·4		☌		12	49·6	
			16 45·6					19 14·4
iii	0	0		□	iii	0	0	
			27 56·0					32 4·0
iv	0	0		△	iv	0	0	
			13 58·0					16 2·0
	13	58 0		☐		16	2·0	
			8 22·8					9 37·2
	22	20·8		±		25	39·2	
			5 35·2					6 24·8
v	0	0		∓	v	0	0	
			27 56·0					32 4.0
vi	0	0		☍	vi	0	0	

Ex. 12 [Page 29]

♅	Sets	4°	23″·9	W.H.D.	Sets	185°	37″·8	E.H.D.
♆	,,	6	23·4	,,	,,	183	32·5	,,
♀	,,	88	40·4	,,	,,	86	29·6	,,
☉	,,	132	37·7	,,	,,	36	4·1	,,
☽	,,	147	15·1	,,	,,	20	39·3	,,
♄	,,	153	27·6	,,	,,	15	29·5	,,
☿	,,	153	59·3	,,	,,	13	36·9	,,
♂	Rises	3	24·4	E.H.D.	Rises	187	14·6	W.H.D.
♇	,,	77	13·5	,,	,,	99	39·2	,,

Ex. 13 [Page 29]

♅	0·04843	☉	9·94538	☿	9·94009
♆	0·04798	☽	9·94156	♂	0·05145
♀	9·97667	♄	9·94661	♇	9·98493

In all the solutions of Exercises 14 to 59, a life span of 75 years only has been adopted.

Ex. 14 [Page 29]

♂	□	M.C.	3° 24′·4	♆	☍	M.C.	18° 15′·9	♃	□	M.C.	4° 23′·9
	☌		20 20·5		☌		24 9·7		△		32 43·6
	✶		31 37·9		☐		33 0·3		☐		46 53·5
	∠		45 44·7		△		47 44·7		☌		55 23·4
	⊥		54 12·7						☍		61 3·3
	⚺		59 51·4								
♅	□	M.C.	6° 23′·4	☿	♂	M.C.	1° 5′·4	☉	∠	M.C.	6° 6′·4
	△		34 44·1		⚺		30 17·1		⊥		14 32·6
	☐		48 54·4		⊥		36 7·4		⚺		20 9·9
	☌		57 24·7		∠		44 52·9		♂		48 16·9
	☍		63 4·8		✶		59 28·7				
☽	✶	M.C.	7° 19′·8	♄	☌	M.C.	1° 24′·2	☿	☌	M.C.	3° 8′·7
	∠		21 19·4		✶		12 40·0		✶		14 19·1
	⊥		29 43·1		⚺		26 44·7		∠		28 17·1
	⚺		35 18·9		⊥		35 11·6		⊥		36 39·9
	♂		63 18·0		⚺		40 49·5		⚺		42 15·1
					♂		68 59·0		♂		70 11·1

Ex. 15 [Page 29]

♂	♂	Asc.	3° 24′·4	♆	☌	Asc.	6° 28′·3	♃	♂	Asc.	4° 23′·9
	⚺		31 37·9		✶		18 15·9		☍		32 43·6
	⊥		37 16·6		∠		33 0·3		☌		38 23·5
	∠		45 44·7		⊥		41 50·9		☐		46 53·4
	✶		59 51·4		⚺		47 44·7		△		61 3·3
	☌		71 8·8								
♅	♂	Asc.	6° 23′·4	☿	□	Asc.	1° 5′·4	☉	∠	Asc.	6° 6′·4
	☍		34 44·1		△		30 17·1		✶		20 9·8
	☌		40 24·2		☐		44 52·9		☌		31 24·8
	☐		48 54·4		☌		53 38·4		□		48 16·7
	△		63 4·8		☍		59 28·7				
☽	⚺	Asc.	7° 19′·8	♄	⚺	Asc.	12° 40′·0	☿	⚺	Asc.	14° 19′·1
	⊥		12 55·6		⊥		18 17·9		⊥		19 54·3
	∠		21 19·3		∠		26 44·8		∠		28 17·1
	✶		35 18·8		✶		40 49·5		✶		42 15·1
	☌		46 30·5		☌		52 5·3		☌		53 25·5
	□		63 18·0		□		68 59·0		□		70 11·1

Ex. 16 [Page 29]

♂ ☍ ♂	28° 36′.4	♂ ♂ ☿	17° 9′.9	♂ ♂ ♄	18° 56′.1
⊥	34 15 .1	☍	45 23 .4	☍	47 9 .6
∠	42 43 .2	⊥	51 2 .1	⊥	52 48 .3
✶	56 49 .9	∠	59 30 .1	∠	61 16 .3
☌	68 7 .3	✶	73 36 .9		
♂ ♂ ☽	24° 14′.4	♂ ⊥ ☉	5° 44′.7	♂ □ ♀	2° 13′.3
☍	52 27 .9	☍	11 23 .4	☌	19 17 .4
⊥	58 6 .6	♂	39 36 .9	✶	30 34 .8
∠	66 34 .6	☍	67 50 .4	∠	44 41 .6
		⊥	73 29 .1	⊥	53 9 .6
				☍	58 48 .3
♂ ☍ ♅	25° 56′.0	♂ ☍ ♃	27° 42′.8	♂ □ ♆	14° 8′.7
±	31 34 .7	±	33 21 .5	△	42 22 .2
☐	40 2 .8	☐	41 49 .6	☐	56 28 .9
△	54 9 .5	△	55 56 .3	±	64 57 .0
				⚻	70 35 .7

Ex. 17]Page 29]

♆ ☍ ♆	29° 28′.8	♆ ☌ ♂	3° 18′.6	♆ □ ☿	3° 9′.2
⊥	35 22 .6	✶	15 6 .2	☌	20 50 .4
∠	44 13 .1	∠	29 50 .6	✶	32 38 .0
✶	58 57 .5	⊥	38 41 .1	∠	47 22 .4
☌	70 45 .1	☍	44 34 .9	⊥	56 12 .9
		♂	74 3 .7	☍	62 6 .7
♆ □ ♄	5° 0′.2	♆ □ ☽	10° 32′.6	♆ □ ☉	26° 36′.1
☌	22 41 .4	☌	28 13 .8	☌	44 17 .3
✶	34 29 .0	✶	40 1 .4	✶	56 4 .9
∠	49 13 .4	∠	54 45 .8	∠	70 49 .3
⊥	58 3 .9	⊥	63 36 .3		
☍	63 57 .7	☍	69 30 .1		
♆ ☍ ♀	17° 9′.9	♆ △ ♅	12° 18′.8	♆ △ ♃	14° 10′.2
±	23 3 .7	☐	27 3 .2	☐	28 54 .6
☐	31 54 .3	±	35 53 .8	±	37 45 .2
△	46 38 .7	⚻	41 47 .6	⚻	43 49 .0
		☊	71 16 .4	☊	73 7 .8

Ex. 18 [Page 29]

☽ ☌ ☽	28° 47′·6	☽ □ ♆	15° 10′·5	☽ ✶ ♂	1° 0′·1
♇	34 27·5	☊	32 10·4	☍	26 42·0
∠	42 57·4	✶	43 30·3	±	32 22·0
✶	57 7·3	∠	37 40·2	☐	40 51·9
☊	68 27·2	⊥	66 10·1	△	55 1·8
		⚺	71 50·0		

☽ ✶ ♄	18° 12′·4	☽ ✶ ♄	19° 59′·1	☽ ✶ ☽	25° 18′·5
☍	46 32·1	☍	48 18·8	☍	53 38·2
±	52 12·1	±	53 58·8	±	59 18·2
☐	60 42·2	☐	62 28·7	☐	67 48·1
△	74 51·9				

☽ ± ☉	60° 44′·6	☽ □ ♀	3° 12′·9	☽ ⚺ ♅	27° 0′·6
☍	12 24·6	△	31 40·2	⊥	32 40·5
✶	40 44·3	☐	45 50·1	∠	41 10·4
☍	69 4·0	±	54 20·0	✶	55 20·3
±	74 44·0	☍	60 0·0	☊	66 40·2

Ex. 19 [Page 30]

♅ ⚺ ♅	29° 0′·7	♅ ♂ ☽	1° 59′·7	♅ □ ♆	17° 10′·4
⊥	34 40·8	⚺	30 47·9	☊	34 10·8
∠	43 11·0	⊥	36 28·0	✶	45 31·1
✶	57 21·3	∠	44 58·2	∠	59 41·4
☊	68 41·6	✶	59 58·5	⊥	68 11·6
		☊	70 28·8	⚺	73 51·7

♅ ✶ ♂	2° 59′·8	♅ ✶ ♀	20° 12′·3	♅ ✶ ♄	21° 59′·1
☍	31 41·8	☍	48 33·0	☍	50 19·8
±	37 21·9	±	54 13·1	±	55 59·9
☐	45 52·1	☐	62 43·3	☐	64 30·1
△	60 2·4				

♅ ✶ ☽	27° 18′·7	♅ ± ☉	8° 44′·3	♅ □ ♀	5° 12′·6
☍	55 39·4	☍	14 24·4	△	33 40·7
±	61 19·9	✶	42 45·1	☐	47 51·1
☐	69 49·7	☍	71 5·8	±	56 21·2
				☍	62 1·3

Ex. 20 [Page 30]

☿ ☌ ☿	29° 11′·7	☿ ☍ ♅	12° 42′·8	☿ ☍ ♃	14° 33′·1
⊥	35 2·0	✶	24 23·5	✶	26 13·8
∠	43 47·5	∠	38 59·3	∠	40 49·6
✶	58 23·3	⊥	47 44·8	⊥	49 35·1
☍	70 4·0	☌	53 35·1	☌	55 25·4
☿ ⚷ ♆	12° 11′·8	☿ △ ♂	27° 9′·3	☿ □ ☿	15° 19′·2
⚻	41 23′·5	□	41 45·1	△	44 30·9
⚺	47 13·8	⚺	50 30·6	□	59 6·7
□	55 59·3	⚻	56 20·9	⚺	67 52·2
△	70 33·1			⚻	73 42·5
☿ □ ♄	17° 9′·1	☿ ☍ ☽	5° 7′·3	☿ ✶ ☉	9° 20′·8
△	46 20·8	□	22 38·3	☍	21 1·5
□	60 56·6	△	51 50·0	□	38 32·5
⚺	69 42·1	□	66 25·8	△	67 44·2

Ex. 21 [Page 30]

☉ ☌ ☉	28° 7′·0	☉ ∠ ☿	5° 3′·4	☉ □ ♅	0° 25′·8
⊥	33 44·3	⊥	13 29·5	△	14 29·3
∠	42 10·4	☌	19 6·9	□	42 36·3
✶	56 13·9	♂	47 13·9	☍	59 28·5
☍	67 28·7			✶	70 43·3
☉ □ ♃	2° 12′·1	☉ △ ♆	2° 44′·7	☉ ∠ ♂	3° 5′·5
△	16 15·6	□	16 48·2	✶	17 9·0
□	44 22·6	⚺	25 14·3	☍	28 23·8
☍	61 14·8	⚻	30 51·6	□	45 16·0
✶	72 29·6	♂	58 58·6	△	73 23·0
☉ ☌ ☿	5° 45′·1	☉ ☌ ♄	7° 31′·0	☉ ☌ ☽	12° 48′·0
⊥	11 22·5	⊥	13 8·3	⊥	18 25·3
∠	19 48·6	∠	21 34·4	∠	26 51·4
✶	33 52·1	✶	35 37·9	✶	40 54·9
☍	46 6·9	☍	46 52·7	☍	52 9·7
□	61 59·1	□	63 44·9	□	69 1·9

Ex. 22 [Page 30]

☽ ☌ ☽	27° 59′·1	☽ ☍ ☉	15° 14′·7	☽ ✶ ♀	6° 17′·1
⊥	33 34·9	☌	43 13·8	⊥	20 16·7
∠	41 58·6	⊥	48 49·6	⊥	28 40·4
✶	55 58·2	∠	57 13·3	☌	34 16·2
☐	67 9·9	✶	71 12·9	☍	62 15·3

☽ ☌ ♅	1° 40′·8	☽ ☌ ♃	3° 26′·6	☽ △ ♆	17° 58′·6
±	7 16·6	±	9 2·4	☐	31 58·2
☐	15 40·3	☐	17 26·1	±	40 21·9
△	29 39·9	△	31 25·7	∓	45 57·7
□	57 39·0	□	59 24·8	☍	73 56·8
☐	74 26·4				

☽ ☌ ☍	4° 19′·8	☽ ☌ ☿	20° 58′·2	☽ ☌ ♄	22° 43′·6
⊥	9 55·6	⊥	26 34·0	⊥	28 19·4
∠	18 19·3	∠	34 27·7	∠	36 43·1
✶	32 18·9	✶	48 57·3	✶	50 42·7
☐	43 30·6	☐	60 9·0	☐	61 54·4
□	60 18·0				

Ex. 23 [Page 30]

♄ ☌ ♄	28° 9′·5	♄ ☍ ☽	5° 17′·5	♄ ☍ ☉	20° 37′·8
⊥	33 47·4	☌	33 27·0	☌	48 47·3
∠	42 14·3	⊥	39 4·9	⊥	54 25·2
✶	56 19·0	∠	47 31·8	∠	62 52·1
☐	67 34·8	✶	61 36·5		
		☐	72 52·3		

♄ ☐ ♀	0° 21′·2	♄ ☍ ♅	6° 58′·9	♄ ☍ ♃	8° 45′·4
✶	11 37·0	±	12 36·8	±	14 23·3
∠	25 41·7	☐	21 3·7	☐	22 50·2
⊥	34 8·6	△	35 8·4	△	36 54·9
☌	39 46·5	□	63 17·9	□	65 4·4
☍	67 56·0				

♄ △ ♆	23° 22′·8	♄ ☌ ☍	9° 38′·9	♄ ☌ ☿	26° 23′·5
☐	37 27·5	⊥	15 16·8	⊥	32 1·4
±	45 54·4	∠	23 43·7	∠	40 28·3
∓	51 32·3	✶	37 48·4	✶	54 33·0
		☐	49 4·2	☐	65 48·8
		□	65 57·9		

Ex. 24 [Page 30]

☿ ⚺ ☿	27° 56′·0	
⊥	33 31·2	
∠	41 54·0	
✶	55 52·0	
☌	67 2·4	
☿ ☌ ☉	22° 13′·1	
⚺	50 9·1	
⊥	55 44·3	
∠	64 7·1	
☿ ⚻ ∠	10° 26′·4	
⚌	16 1·6	
☐	24 24·4	
△	38 22·4	
□	66 18·4	
☿ ☌ ♄	1° 45′·2	
⚺	29 41·2	
⊥	35 16·4	
∠	43 39·2	
✶	57 37·2	
☌	68 47·6	
☿ ♀ ♀	2° 6′·2	
✶	13 16·6	
∠	27 14·6	
⊥	35 37·4	
⚺	41 12·6	
☍	69 8·6	
☿ △ Ψ	24° 56′·7	
☐	38 54·7	
⚌	47 17·5	
⚻	52 52·7	
☿ ☌ ☽	7° 0′·2	
⚺	34 56·2	
⊥	40 31·4	
∠	48 54·2	
✶	62 52·2	
☌	74 2·6	
☿ ⚻ ♅	8° 40′·8	
⚌	14 16·0	
☐	22 38·8	
△	36 36·8	
□	64 32·8	
☿ ⚺ ☍	11° 19′·4	
⊥	16 54·6	
∠	25 17·4	
✶	39 15·4	
☌	50 25·8	
□	67 11·4	

Ex. 25 [Page 30]

☿ □ M.C.	13° 36′·9	
△	45 40·9	
☐	61 42·9	
⚌	71 20·1	
☉ ✶ M.C.	7° 57′·1	
☌	19 11·9	
□	36 4·0	
△	67 57·0	
♃ ☌ M.C.	14° 36′·3	
✶	27 16·4	
∠	43 6·5	
⊥	52 36·6	
⚺	58 56·7	
♄ □ M.C.	15° 29′·5	
△	47 20·0	
☐	63 15·3	
⚌	72 48·4	
♀ ⚺ M.C.	28° 6′·3	
⊥	33 56·6	
∠	42 42·1	
✶	57 17·9	
☌	68 58·6	
Ψ ☍ M.C.	11° 12′·9	
⚻	40 41·7	
⚌	46 35·5	
☐	55 26·1	
△	70 10·5	
☽ □ M.C.	20° 39′·3	
△	52 40·2	
☐	68 40·6	
♅ ☌ M.C.	12° 36′·2	
✶	25 15·9	
∠	41 5·6	
⊥	50 35·4	
⚺	56 55·3	
☍ △ M.C.	28° 22′·1	
☐	44 15·4	
⚌	53 47·3	
⚺	60 8·6	

Ex. 26 [Page 30]

☿ ☌	Asc.	13°	36′·9	♄ ☌	Asc.	15°	29′·5	☽ ☌	Asc.	20°	39′·3
	⚺	45	40·9		⚺	47	20·0		☍	52	40·2
	⊥	52	5·7		⊥	53	42·1		⊥	59	4·4
	∠	61	42·9		∠	63	15·3		∠	68	40·7
☉ ⚺	Asc.	7°	57′·1	♀ ☐	Asc.	16°	25′·6	♅ ☍	Asc.	25°	15′·9
	☌	36	4·1		✶	28	6·3		±	31	35·8
	⚺	67	57·1		∠	42	42·1		☐	41	5·6
	⊥	74	19·8		⊥	51	27·6		△	56	55·3
					⚺	57	17·9				
♃ ☍	Asc.	27°	16′·4	♆ □	Asc.	11°	12′·9	☌ ⚺	Asc.	28°	22′·1
	±	33	36·4		△	40	41·6		⊥	34	43·4
	☐	43	6·5		☐	55	26·0		∠	44	15·4
	△	58	56·6		±	64	16·6		✶	60	8·6
					☍	70	10·4				

Ex. 27 [Page 30]

☿ ⚺ ☿	30°	3′·1	☿ ☌ ☌	17°	3′·1	☿ □ ♆	2°	59′·4
⊥	36	27·9	⚺	49	7·1	☐	20	39·4
∠	46	5·1	⊥	55	31·9	✶	33	29·0
✶	62	7·1	∠	65	9·1	∠	49	31·0
☐	74	56·7				⊥	59	8·2
						⚺	65	33·0
☿ ☍ ♃	18°	3′·9	☿ ☍ ♅	20°	5′·2	☿ □ ♀	14°	48′·8
☍	50	7·9	☍	52	9·2	△	46	52·8
±	56	32·7	±	58	34·0	☐	62	54·8
☐	66	9·9	☐	68	11·2	±	72	32·0
☿ ⚺ ☉	5°	43′·0	☿ ⚺ ☽	22°	0′·8	☿ ⚺ ♄	28°	2′·3
⊥	11	18·2	⊥	28	25·6	⊥	34	27·1
∠	20	34·9	∠	38	2·8	∠	44	4·3
✶	36	36·9	✶	54	4·8	✶	60	6·3
☐	49	26·5	☐	66	54·4	☐	72	55·9
□ ☿	68	40·9						

Ex. 28 [Page 30]

♄ ☍ ♄	29° 48′·9	♄ ☌ ☿	1° 46′·0	♄ ☌ ☌	18° 54′·3
⊥	36 11·0	☍	31 48·8	☍	50 44·8
∠	45 44·1	⊥	38 10·9	⊥	57 6·9
✶	61 39·4	∠	47 44·0	∠	66 40·0
☌	74 23·6	✶	63 39·3		
♄ □ ♆	4° 46′·8	♄ ☍ ♃	19° 54′·8	♄ ☍ ♅	21° 55′·1
☌	22 29·0	⚻	51 45·3	⚻	53 45·6
✶	35 13·2	⚹	58 7·4	⚹	60 7·7
∠	51 8·5	☐	67 40·5	☐	69 40·8
⊥	60 41·6				
☍	67 3·7				
♄ □ ♀	16° 40′·9	♄ ☍ ☉	7° 31′·7	♄ ☍ ☽	23° 50′·0
△	48 31·4	⊥	13 9·6	⊥	30 12·1
☐	64 26·7	∠	22 24·5	∠	39 45·2
⚹	73 59·8	✶	38 19·8	✶	55 40·5
		☌	51 4·0	☌	68 24·7
		□	70 10·3		

Ex. 29 [Page 30]

☽ ☍ ☽	29° 2′·4	☽ ☌ ♄	5° 15′·5	☽ ☌ ☿	7° 0′·8
⊥	35 26·9	☍	35 3·4	☍	37 3·9
∠	45 2·9	⊥	41 27·6	⊥	43 28·1
✶	61 3·3	∠	51 3·9	∠	53 4·4
☌	73 51·7	✶	67 4·3	✶	69 4·8
☽ ☌ ☌	24° 5′·2	☽ □ ♆	10° 0′·5	☽ ☍ ♃	25° 6′·0
☍	56 6·1	☌	27 41·0	⚻	57 6·9
⊥	62 30·3	✶	40 29·4	⚹	63 31·1
∠	72 6·6	∠	56 29·8	☐	73 7·4
		⊥	66 6·1		
		☍	72 30·3		
☽ ☍ ♅	27° 7′·0	☽ ☌ ♀	4° 54′·5	☽ ☍ ☉	12° 44′·5
⚻	59 7·9	□	21 51·0	⊥	18 20·3
⚹	65 32·1	△	63 51·9	∠	27 36·5
				✶	43 36·9
				☌	56 25·3

Ex. 30 [Page 30]

☉ ☌ ☉ 28° 7′·0	☉ ☍ ☽ 15° 19′·0	☉ ☍ ♄ 20° 35′·9
⊥ 33 44·3	☌ 44 25·2	☌ 50 24·6
∠ 42 59·5	⊥ 50 47·9	⊥ 56 47·3
✳ 58 56·0	∠ 60 21·8	∠ 66 21·2
☊ 71 41·2		
☉ ☍ ☿ 22° 21′·8	☉ ⊥ ♂ 5° 20′·6	☉ □ ♆ 25° 22·3
☌ 52 24·7	☌ 10 57·9	☊ 43 4·0
⊥ 58 47·4	☍ 39 29·1	✳ 55 49·2
∠ 68 21·3	☌ 71 22·1	∠ 71 45·7
☉ ± ♃ 6° 14′·0	☉ ± ♅ 8° 0′·3	☉ ✳ ♀ 9° 0′·1
⚺ 11 51·3	⚺ 13 37·6	☊ 20 14·9
☍ 40 29·8	☍ 42 30·3	□ 37 15·5
⚺ 72 22·8	⚺ 74 23·3	△ 69 8·5

Ex. 31 [Page 30]

♀ ☌ ♀ 29° 11′·7	♀ ∠ ☉ 5° 55′·1	♀ ✳ ☽ 6° 33′·4
⊥ 35 2·0	⊥ 14 0·6	∠ 21 9·2
∠ 43 47·5	☌ 19 50·9	⊥ 29 54·7
✳ 58 23·3	☍ 49 2·6	☌ 35 45·0
☊ 70 4·0		☍ 64 56·7
♀ ☊ ♄ 0° 21′·8	♀ ☊ ☿ 2° 11′·8	♀ □ ♂ 2° 2′·4
✳ 12 2·5	✳ 13 52·5	☊ 19 33·4
∠ 26 38·3	∠ 28 28·3	✳ 31 14·1
⊥ 35 23·8	⊥ 37 13·8	∠ 45 49·9
☌ 41 14·1	☌ 43 4·1	⊥ 54 35·4
☍ 70 25·8	☍ 72 15·8	☌ 60 25·7
♀ ⚺ ♆ 16° 59′·9	♀ □ ♃ 2° 57′·9	♀ □ ♅ 4° 48′·2
± 22 50·2	△ 32 9·6	△ 33 59·9
☊ 31 35·7	☊ 46 45·4	☊ 48 35·7
△ 46 11·5	± 55 30·9	± 57 21·2
	⚺ 61 21·2	⚺ 63 11·5

Ex. 32 [Page 30]

♅	☌	♅	31° 39′·3	♅	☍	♀	13° 47′·1	♅	□	☉	0° 29′·1
		⊥	37 59·2			⚹	26 26·8			△	16 18·8
		∠	47 29·0			∠	42 16·5			□	47 58·1
		⚹	63 18·7			⊥	51 46·3			☍	66 57·7
						☌	58 6·2				
♅	☌	☽	1° 54′·1	♅	☌	♄	7° 51′·0	♅	☌	♃	9° 50′·2
		⚺	8 14·0			⚺	14 10·9			⚺	16 10·1
		□	17 43·8			□	23 40·7			□	25 39·9
		△	33 33·5			△	39 30·4			△	41 29·6
		□	65 12·8			□	71 9·7			□	73 8·9
♅	☌	♂	28° 39′·5	♅	△	♆	13° 13′·4	♅	☌	♇	22° 29′·7
		⚺	34 59·4			□	29 3·1			⊥	35 59·6
		□	44 29·2			⚺	38 22·9			⊥	45 29·4
		△	60 18·9			☌	44 52·8			⚹	61 19·9
										☍	73 58·8

Ex. 33 [Page 30]

♇	☌	♇	31° 40′·3	♇	♂	♅	1° 59′·7	♇	☍	♀	15° 47′·2
		⊥	38 0·4			☌	33 40·0			⚹	28 27·3
		∠	47 30·5			∠	40 0·1			∠	44 17·4
		⚹	63 20·6			⚹	49 30·2			⊥	53 47·5
						☍	65 20·3			☌	60 7·6
♇	□	☉	2° 28′·9	♇	☌	☽	3 53′·9	♇	☌	♄	9° 50·9
		△	18 19·0			⚺	10 13·9			⚺	16 10·9
		□	49 59·9			□	19 44·0			□	25 41·0
		☍	68 59·4			△	35 34·1			△	41 31·0
						□	67 14·4			□	73 11·4
♇	☌	♄	11° 50′·1	♇	☌	♂	30° 40′·1	♇	△	♆	15° 13′·5
		⚺	18 10·1			⚺	37 0·1			□	31 3·6
		□	27 40·2			□	46 30·2			⚺	40 33·7
		△	43 30·3			△	62 20·3			☌	46 53·7

Ex. 34 [Page 30]

♆ ☌ ♆	29° 28′·8	♆ □ ♃	15° 18′·5	♆ □ ♅	17° 9′·9
☍	35 22·6	☊	32 59·7	☊	34 51·1
∠	44 13·1	⚹	44 47·3	⚹	46 38·7
⚹	58 57·5	∠	59 31·7	∠	61 23·1
☊	70 45·1	⊥	68 22·2	⊥	70 13·6
		☌	74 16·0		
♆ ♂ ♀	12° 18′·9	♆ △ ☉	2° 52′·7	♆ △ ☽	18° 56′·2
☌	41 47·7	□	17 37·1	□	33 40·6
☍	47 41·5	☍	26 27·7	☍	42 31·2
□	56 32·1	☌	32 21·5	☌	48 25·0
△	71 16·5	♂	61 50·3		
♆ △ ♄	24° 28′·6	♆ △ ☿	26° 19′·5	♆ □ ♂	14° 22′·5
□	39 13·0	□	41 3·9	△	43 51·3
☍	48 3·6	☍	49 54·5	□	58 35·7
☌	53 57·4	☌	55 48·3	☍	67 26·3
				☌	73 20·1

Ex. 35 [Page 30]

♂ ☌ ♂	31° 46′·5	♂ ☊ ♆	3° 34′·3	♂ ♂ ♃	1° 0′·4
⊥	38 7·8	⚹	16 16·9	☌	32 46·9
∠	47 39·8	∠	32 10·1	☍	39 8·2
⚹	63 33·0	⊥	41 42·1	□	48 40·1
		☌	48 3·4	△	64 33·4
♂ ♂ ♅	3° 0′·4	♂ △ ♀	29° 33′·3	♂ ∠ ☉	3° 29′·7
☌	34 46·9	□	45 26·6	⚹	19 23·0
☍	41 8·2	☍	54 58·5	☊	32 5·6
□	50 40·1	☌	61 19·8	☐	51 9·5
△	66 33·4				
♂ ☌ ☽	4° 54′·9	♂ ☌ ♄	10° 53′·2	♂ ☌ ☿	12° 52′·8
⊥	11 16·2	⊥	17 14·5	⊥	19 14·1
∠	20 48·2	∠	26 46·5	∠	28 46·1
⚹	36 41·4	⚹	42 39·7	⚹	44 39·3
☊	49 24·0	☊	55 22·3	☊	57 21·9
☐	68 27·9	☐	74 26·2		

Ex. 36 [Page 33]	♂ ☌ ♄	18° 56′1		Ex. 42 [Page 46]	☉ ∥ ♀	(Type 1)	49° 19′8
Ex. 37 [Page 33]	♃ ✶ ♃	57 7·3		Ex. 43 [Page 46]	♂ ∥ ♃	(,,)	7 19·3
Ex. 38 [Page 33]	☉ □ ♅	42 36·3		Ex. 44 [Page 46]	♆ ∥ ☉	(Type 2)	39 24·4
Ex. 39 [Page 36]	68th year	(67° 44′2)	♀ △ ☉	Ex. 45 [Page 46]	♆ ∥ ♆	(Type 1)	22 25·8
Ex. 40 [Page 36]	37th year	(36 54·9)	♄ $\overset{\frown}{\triangle}$ ♃	Ex. 46 [Page 46]	♅ ∥ ♄	(,,)	11 1·6
Ex. 41 [Page 36]	72nd year	(71 16·4)	♆ ☌ ♅	Ex. 47 [Page 46]	☽ ∥ ♂	(Type 2)	17 37·7

Ex 48 [Page 46]

S.P.		♀		☉		☽		♄		♅		♂		♆		♃		♅	
♀	D	**1**	**5·4**	**1**	**3·0**	**1**	**2·7**	**1**	**3·1**	**1**	**2·6**	**1**	**3·2**	**1**	**8·4**	**1**	**10·9**	**1**	**10·9**
	N	1	9·0	1	11·4	1	11·7	1	11·3	1	11·8	1	11·2	1	6·0	1	3·5	1	3·5
☉	D	**50**	**7·9**	**48**	**16·8**	**48**	**3·3**	**84**	**21·2**	**47**	**58·0**	**48**	**28·0**	**52**	**24·5**	**54**	**23·1**	**54**	**21·5**
	N	52	53·9	54	45·0	54	58·5	54	40·7	55	3·7	54	33·8	50	37·3	48	38·7	48	40·3
☽	D	**66**	**3·9**	**63**	**37·5**	**63**	**19·6**	**63**	**43·3**	**63**	**12·7**	**63**	**52·3**	**69**	**4·1**	**71**	**40·2**	**71**	**38·1**
	N	69	42·7	72	9·1	72	26·9	72	3·4	72	33·8	71	54·3	66	42·6	64	6·4	64	8·5
♄	D	**71**	**31·3**	**68**	**52·7**	**68**	**33·6**	**68**	**59·0**	**68**	**25·9**	**69**	**8·8**	**74**	**46·1**	**77**	**35·2**	**77**	**33·0**
	N	75	28·1	78	6·6	78	25·9	78	0·4	78	33·3	77	50·6	72	15·2	69	24·0	69	26·3
♅	D	**73**	**21·2**	**70**	**38·6**	**70**	**18·8**	**70**	**45·1**	**70**	**11·2**	**70**	**55·1**	**76**	**41·1**	**79**	**34·6**	**79**	**32·2**
	N	77	24·1	80	6·7	80	26·5	80	0·3	80	34·1	79	50·3	74	4·2	71	10·7	71	13·1
♂	D	**84**	**27·3**	**81**	**20·0**	**80**	**57·3**	**81**	**27·4**	**80**	**48·4**	**81**	**39·1**	**88**	**17·4**	**91**	**37·1**	**91**	**34·5**
	N	89	6·9	92	14·0	92	36·9	92	6·8	92	45·6	91	55·2	85	16·8	81	57·0	81	59·8
♆	D	**11**	**6·4**	**10**	**41·8**	**10**	**38·8**	**10**	**42·8**	**10**	**37·6**	**10**	**44·3**	**11**	**36·7**	**12**	**2·9**	**12**	**2·6**
	N	11	43·2	12	7·8	12	10·8	12	6·8	12	11·9	12	5·3	11	12·9	10	46·6	10	47·0
♃	D	**83**	**31·9**	**80**	**26·8**	**80**	**4·2**	**80**	**34·1**	**79**	**55·5**	**80**	**45·5**	**87**	**19·5**	**90**	**37·0**	**90**	**34·4**
	N	88	8·5	91	13·6	91	36·2	91	6·4	91	44·9	90	55·0	84	20·9	81	3·3	81	6·0
♅	D	**81**	**41·4**	**78**	**40·3**	**78**	**18·3**	**78**	**47·5**	**78**	**9·8**	**78**	**58·8**	**85**	**24·0**	**88**	**37·3**	**88**	**34·6**
	N	86	12·0	89	13·0	89	35·1	89	5·9	89	43·5	88	54·7	82	29·3	79	16·1	79	18·8

LESSON IV [Pages 47 to 53]

Ex. 46 [Page 52]

Body	R. A.	Diff	S. D. A.	S. N. A.	U. M. D.	L. M. D.
♀	212° 42′·8	89° 39′·9	87° 35′·0	92° 25′·0	1° 5′·4	178° 54′·6
☉	259. 54·2	47 11·4	84 20·9	95 39·1	48 16·8	131 43·2
☽	274 57·0	15 2·8	83 57·2	96 2·8	63 19·6	116 40·4
♄	280 36·5	5 39·5	84 28·5	95 31·5	68 59·0	111 1·0
☿	281 48·6	1 12·1	83 48·1	96 11·9	70 11·2	109 48·8
♂	299 42·3	17 53·7	84 40·5	95 19·5	83 4·8	91 55·2
♆	20 24·6	80 42·3	91 33·7	88 26·3	168 47·1	11 12·9
♃	121 0·5	100 35·9	95 0·8	84 59·2	90 37·0	89 23·0
♅	123 2·9	2 2·4	94 58·0	85 2·0	88 34·6	91 25·4

Ex. 50 [Page 53]

1st Mer. Half			2nd Mer. Half		
♂	R. P. ☉	68° 8′·4	☽ R. P. ♂	75° 4′·2	
	R. P. ♀	45 19·0	R. P. ☿	66 53·6	
	R. P. ♅	4 48·6	R. P. ♄	65 40·3	
	R. P. ♃	3 52·4			

Ex. 51 [Page 53]

1st Mer. Half			2nd Mer. Half		
♄	R. P. ♆	59° 41′·6	♆ R. P. ♂	46° 6′·7	
	R. P. ♅	3 54·8	R. P. ☿	54 43·9	
	R. P. ♃	4 57·9	R. P. ♄	55 52·7	
			R. P. ☽	58 25·7	
			R. P. ☉	66 33·6	

Examples 42 to 59 have been erroneously numbered in the body of the book as examples 32 to 49.

LESSON V [Pages 54 to 69]

Ex. 52 [Page 66]

	S. A. with Lat.	T. P. L.	S. A. with No Lat.	T. P. L.
♂	95° 19′·5	0·27606	94° 59′·8	0·27757
♆	88 26·3	0·30863	88 3·8	0·31048
♃	95 0·8	0·27749	94 55·4	0·27790
♅	94 58·0	0·27770	94 49·0	0·27839
♀	87 35·0	0·31285	86 58·6	0·31587
☉	84 20·9	0·32920	84 20·9	0·32920
☽	83 57·2	0·33123	84 16·8	0·32953
♄	84 28·5	0·32854	84 21·6	0·32914
☿	83 48·1	0·33202	84 22·7	0·32904

Ex. 53 [Page 66]

From	To M.C.	♀	⊙	☽	♄	♅	Asc.	♂	♆	♃	♇
M.C.	—	0° 11′·2	46° 51′·3	60° 38′·1	65° 54′·4	66° 49′·5	80° 42′·1	83° 30′·0	167° 29′·7	[95° 4′·7]	[93° 10′·4]
♀	[0 11·2]	—	46 40·1	60 26·9	65 43·2	66 38·3	80 30·9	83 18·8	167 18·5	[95 15·9]	[93 21·6]
⊙	[46 51·3]	[46 40·1]	—	13 46·8	19 3·1	19 58·2	33 50·8	36 38·7	120 38·4	[141 56·0]	[140 1·7]
☽	[60 38·1]	[60 26·9]	[13 46·8]	—	5 16·3	6 11·4	20 4·0	22 51·9	106 51·6	[155 43·8]	[153 49·5]
♄	[65 54·4]	[65 43·2]	[19 3·1]	[5 16·3]	—	0 55·1	14 47·7	17 35·6	101 35·3	[160 59·1]	[159 4·8]
♅	[66 49·5]	[66 38·3]	[19 58·2]	[6 11·4]	[0 55·1]	—	13 52·6	16 40·5	100 40·2	[161 54·2]	[159 59·9]
Asc.	[80 42·1]	[80 30·9]	[33 50·8]	[20 4·0]	[14 47·7]	[13 52·6]	—	2 47·9	86 47·6	[175 46·8]	[173 52·5]
♂	[83 30·0]	[83 18·8]	[36 38·7]	[22 51·9]	[17 35·6]	[16 40·5]	[2 47·9]	—	83 59·7	[178 34·7]	[176 40·4]
♆	[167 29·7]	[167 18·5]	[120 38·4]	[106 51·6]	[101 35·3]	[100 40·2]	[86 47·6]	[83 59·7]	—	97 25·6	99 19·9
♃	95 4·7	95 15·9	141 56·0	155 43·8	169 59·1	161 54·2	175 46·8	178 34·7	[97 25·6]	—	1 54·3
♇	93 10·4	93 21·6	140 1·7	153 49·5	159 4·8	159 59·9	173 52·5	176 40·4	[99 19·9]	[1 54·3]	—

Note.—Figures with no brackets are Anti-Clockwise and Unrectified S. D.'s or Clockwise and Rectified S. D.'s. Figures within brackets are Anti-Clockwise and Rectified S. D.'s or Clockwise and Unrectified S. D.'s.

In Direct directions to Increasing aspects
and in Converse directions to Decreasing aspects

S.P's. in their order.	☌		✶		□		△		☍		▲		□		✶		☌	
♀	214°	3″·3	274°	3″·3	304°	3″·3	334°	3″·3	**34°**	**3″·3**	94°	3″·3	124°	3″·3	154°	3″·3	214°	3″·3
☉	260	43′·4	320	43′·4	350	43′·4	20	43′·4	**80**	**43′·4**	140	43′·4	170	43′·4	200	43′·4	260	43′·4
☽	274	30′·2	334	30′·2	4	30′·2	34	30′·2	**94**	**30′·2**	154	30′·2	184	30′·2	214	30′·2	274	30′·2
♄	279	46′·5	339	46′·5	9	46′·5	39	46′·5	**99**	**46′·5**	159	46′·5	189	46′·5	219	46′·5	279	46′·5
♅	280	41′·6	340	41′·6	10	41′·6	40	41′·6	**100**	**41′·6**	160	41′·6	190	41′·6	220	41′·6	280	41′·6
♂	297	22′·1	357	22′·1	27	22′·1	57	22′·1	**117**	**22′·1**	177	22′·1	207	22′·1	237	22′·1	297	22′·1
♆	21	21′·8	81	21′·8	111	21′·8	141	21′·8	**201**	**21′·8**	261	21′·8	291	21′·8	321	21′·8	21	21′·8
♃	118	47′·4	178	47′·4	208	47′·4	238	47′·4	**298**	**47′·4**	358	47′·4	28	47′·4	58	47′·4	118	47′·4
♇	120	41′·7	180	41′·7	210	41′·7	240	41′·7	**300**	**41′·7**	0	41′·7	30	41′·7	60	41′·7	120	41′·7

In Direct directions to Decreasing aspects
and in Conveyse directions to Increasing aspects.

Ex. 55 [Page 66]

Long. of Limits	S. A.	M. D.	R. A.	O. A. H.	Sum of T. P. L's. S. A.	Long. of Limits	S. A.	M. D.	R. A.	O. A. H.
0° 41′·7	89 N 56′·2	30 L 59′·1	0° 38′·3	0° 34′·5	0·46279	180° 41′·7	89° D 56′·2	30° U 59′·1	180° 38′·3	180° 42′·1
4 30·2	89 N 35·2	27 L 29·4	4 8·0	3 43·2	0·51307	184 30·2	89 D 35·2	27 U 29·4	184 8·0	184 32·8
9 46·5	89 N 6·3	22 L 38·5	8 58·9	8 5·2	0·59499	189 46·5	89 D 6·3	22 U 38·5	188 58·9	189 52·6
10 41·6	89 N 3·0	21 L 47·7	9 49·7	8 52·7	0·61128	190 41·6	89 D 3·0	21 U 47·7	189 49·7	190 46·7
20 43·4	88 N 7·2	12 L 28·9	19 8·5	17 15·7	0·84881	200 43·4	88 D 7·2	12 U 28·9	199 8·5	201 1·3
21 21·8	88 N 3·8	11 L 52·9	19 44·5	17 48·2	0·86991	201 21·8	88 D 3·8	11 U 52·9	199 44·5	201 40·6
27 22·1	87 N 32·5	6 L 13·2	25 24·2	22 56·7	1·14842	207 22·1	87 D 32·5	6 U 13·2	205 24·2	207 51·7
28 47·4	87 N 27·0	4 L 52·1	26 45·3	24 12·3	1·25438	208 47·4	87 D 27·0	4 U 52·1	206 45·3	209 18·3
30 41·7	87 N 15·5	3 L 3·0	28 34·4	25 49·9	1·45650	210 41·7	87 D 15·5	3 U 3·0	208 34·4	211 18·9
34 3·3	86 N 58·6	0 L 10·7	31 48·1	28 46·8	2·68858	214 3·3	86 D 58·6	0 U 10·7	211 48·1	214 49·4
34 30·2	86 N 56·5	0 L 36·7	32 14·1	29 10·6	2·15274	214 30·2	86 D 56·5	0 U 36·7	212 14·1	215 17·6
39 46·5	86 N 31·2	5 L 44·7	37 22·1	33 53·3	1·17783	219 46·5	86 D 31·2	5 U 44·7	217 22·1	220 50·9
40 41·6	86 N 26·9	6 L 38·9	38 16·3	34 43·2	1·11404	220 41·6	86 D 26·9	6 U 38·9	218 16·3	221 49·4
57 22·1	85 N 17·7	23 L 27·8	55 5·2	50 22·9	0·56053	237 22·1	85 D 17·7	23 U 27·8	235 5·2	239 47·5
58 47·4	85 N 12·8	24 L 56·2	56 33·6	51 46·4	0·53366	238 47·4	85 D 12·8	24 U 56·2	236 33·6	241 20·8
60 41·7	85 N 6·3	26 L 55·1	58 32·5	53 38·8	0·49990	240 41·7	85 D 6·3	26 U 55·1	238 32·5	243 26·2
80 43·4	84 N 20·9	48 L 16·9	79 54·3	74 15·2	0·24229	260 43·4	84 D 20·9	48 U 16·9	259 54·3	265 33·4
81 21·8	84 N 20·2	48 L 58·5	80 35·9	74 56·1	0·23605	261 21·8	84 D 20·2	48 U 58·5	260 35·9	266 15·7
94 3·3	84 N 16·6	62 L 47·7	94 25·1	88 41·7	0·12778	274 3·3	84 D 16·6	62 U 47·7	274 25·1	280 8·5
94 30·2	84 N 16·8	63 L 17·0	94 54·4	89 11·2	0·12443	274 30·2	84 D 16·8	63 U 17·0	274 54·4	280 37·6
99 46·5	84 N 21·6	69 L 0·7	100 38·1	94 59·7	0·08721	279 46·5	84 D 21·6	69 U 0·7	280 38·2	286 16·5
100 41·6	84 N 22·7	70 L 0·4	101 37·8	96 0·5	0·08409	280 41·6	84 D 22·7	70 U 0·4	281 37·8	287 15·1
111 21·8	84 N 43·3	81 L 28·1	113 5·5	107 48·8	0·01700	291 21·8	84 D 43·3	81 U 28·1	293 5·5	298 22·2
117 22·1	94 D 59·8	92 U 11·4	119 26·0	114 26·2	0·01302	297 22·1	94 N 59·8	92 L 11·4	299 26·0	304 25·8
118 47·4	94 D 55·4	90 U 42·1	120 35·4	116 0·0	0·01976	298 47·4	94 N 55·4	90 L 42·1	300 35·4	305 50·6
120 41·7	94 D 49·0	88 U 43·0	122 54·4	118 5·4	0·02888	300 41·7	94 N 49·0	88 L 53·0	302 54·4	307 43·4
124 3·3	94 D 37·1	85 U 14·5	126 22·9	121 45·8	0·04274	304 3·3	94 N 37·1	85 L 14·5	306 22·9	311 0·0
140 43·4	93 D 26·5	68 U 30·2	143 7·2	139 40·7	0·13483	320 43·4	93 N 26·5	68 L 30·2	323 7·2	326 33·7
141 21·8	93 D 23·5	67 U 52·6	143 44·8	140 21·3	0·13858	321 21·8	93 N 23·5	67 L 52·6	323 44·8	327 8·3
154 3·3	92 D 20·2	55 U 40·6	155 56·8	153 36·6	0·21970	334 3·3	92 N 20·2	55 L 40·6	335 56·8	338 17·0
154 30·2	92 D 17·9	55 U 15·2	156 22·2	154 4·3	0·22283	334 30·2	92 N 17·9	55 L 15·2	336 22·2	338 40·1
159 46·5	91 D 50·1	50 U 17·9	161 19·5	159 29·4	0·26145	339 46·5	91 N 50·1	50 L 17·9	341 19·5	343 9·6
160 41·6	91 D 45·2	49 U 26·4	162 11·0	160 25·8	0·26854	340 41·6	91 N 45·2	49 L 26·4	342 11·0	343 56·2
170 43·4	90 D 51·0	40 U 8·8	171 28·6	170 37·6	0·35468	350 43·4	90 N 51·0	40 L 8·8	351 28·6	352 19·6
177 22·1	90 D 14·5	34 U 2·3	177 35·1	177 20·6	0·42344	357 22·1	90 N 14·5	34 L 2·3	357 35·1	357 49·6
178 47·4	90 D 6.6	32 U 43·9	178 53·5	178 46·9	0·43980	353 47·4	90 N 6·6	32 L 43·9	358 53·5	359 0·1

Ex. 56 [Page 66]

M.C. ♂ ♀	Impossible	
M.C. ✶ ♀	52	47·7
M.C. ♂ ☉	48	6·0
M.C. ✶ ☽	0	36·7
M.C. ♂ ☽	63	17·0
M.C. ✶ ♄	5	44·7
M.C. ♂ ♄	69	0·7
M.C. ✶ ☿	6	38·9
M.C. ♂ ☿	70	0·4
M.C. ✶ ♂	23	27·8
M.C. △ ♆	48	58·5
M.C. △ ♃	25	6·2
M.C. △ ♅	26	55·1

Ex. 57 [Page 66]

Asc. ✶ ♂	61°	49′·9
Asc. □ ♆	3	51·2
Asc. △ ♆	35	21·7
Asc. △ ♃	60	16·6
Asc. △ ♅	58	11·2
Asc. ✶ ♀	22	28·9
Asc. ♂ ☉	36	4·0
Asc. ♂ ☽	21	0·0
Asc. ♂ ♄	15	20·9
Asc. ♂ ♀	14	22·3

Ex. 58 [Page 66]

☿ ✶ ☿	57°	58′·7
☿ ♂ ♂	16	27·4
☿ ✶ ♂	63	31·7
☿ □ ♆	9	23·9
☿ ✶ ♆	39	53·8
☿ ☍ ♃	17	53·7
☿ △ ♃	74	52·2
☿ ☍ ♅	19	48·3
☿ □ ♀	22	37·9
☿ △ ♀	51	48·5
☿ ✶ ☉	39	17·4
☿ □ ☉	67	18·3
☿ ✶ ☽	52	13·4
☿ ✻ ♄	57	7·5

Ex. 59 [Page 66]

♄ ♂ ♄	Impossible	
♄ ✶ ♄	63°	22′·4
♄ ♂ ☽	5	33·3
♄ ✶ ☽	68	23·4
♄ ♂ ☉	20	37·7
♄ ✶ ♀	6	3·4
♄ ♂ ♀	68	48·6
♄ △ ♅	42	15·8
♄ □ ♅	71	56·3
♄ △ ♃	44	15·7
♄ □ ♃	73	40·5
♄ △ ♆	19	55·7
♄ ✶ ♂	45	44·7
♄ □ ♂	74	59·1
♄ ✶ ☿	62	29·2

N. B.—In Exercises 56 to 59 the minor directions have been left out.

Ex. 60—Prepare the schedule of dates measured to by every minute of arc in the A. D.'s of the primary mundane and zodiacal directions obtaining in the standard nativity.

Arc	In Ordinary year		In Leap year		Arc	In Ordinary year		In Leap year	
1′	Dec.	19	**Dec.**	**19**	31′	June	19	**June**	**19**
2	,,	25	,,	**25**	32	,,	25	,,	**25**
3	,,	31	,,	**31**	33	July	1	**July**	**1**
4	Jan.	6	**Jan.**	**6**	34	,,	7	,,	**7**
5	,,	12	,,	**13**	35	,,	13	,,	**14**
6	,,	19	,,	**19**	36	,,	19	,,	**20**
7	,,	25	,,	**25**	37	,,	25	,,	**26**
8	,,	31	,,	**31**	38	,,	31	**Aug.**	**1**
9	Feb.	6	**Feb.**	**6**	39	Aug.	6	,,	**7**
10	,,	12	,,	**12**	40	,,	13	,,	**13**
11	,,	18	,,	**18**	41	,,	19	,,	**19**
12	,,	24	,,	**24**	42	,,	26	,,	**25**
13	Mar.	2	**Mar.**	**1**	43	Sep.	1	,,	**31**
14	,,	8	,,	**7**	44	,,	7	**Sep.**	**6**
15	,,	14	,,	**14**	45	,,	13	,,	**13**
16	,,	20	,,	**20**	46	,,	19	,,	**19**
17	,,	26	,,	**26**	47	,,	25	,,	**25**
18	Apr.	2	**Apr.**	**1**	48	Oct.	1	**Oct.**	**1**
19	,,	8	,,	**7**	49	,,	7	,,	**7**
20	,,	14	,,	**13**	50	,,	13	,,	**13**
21	,,	20	,,	**19**	51	,,	19	,,	**19**
22	,,	26	,,	**25**	52	,,	25	,,	**25**
23	May	2	**May**	**1**	53	,,	31	,,	**31**
24	,,	8	,,	**7**	54	Nov.	7	**Nov.**	**6**
25	,,	14	,,	**14**	55	,,	13	,,	**13**
26	,,	20	,,	**20**	56	,,	19	,,	**19**
27	,,	26	,,	**26**	57	,,	25	,,	**25**
28	June	1	**June**	**1**	58	Dec.	1	**Dec.**	**1**
29	,,	7	,,	**7**	59	,,	7	,,	**7**
30	,,	13	,,	**13**	60	,,	13	,,	**13**

TABLES

Table I—Right Ascension of every Ecliptic Degree

Table II—Declination of every Ecliptic Degree

Longitude.	R. A.	Variation of Long. per minute	Decl.	Variation of Decl. per minute	Longitude.	R. A.	Variation of Long. per minute	Decl.	Variation of Decl. per minute
		″	N	+″			″	N	+″
1°	0° 55′ 2″·7	55·052	0° 23′ 52″·6	23·868	46°	43° 31′ 52″·7	60·048	16° 38′ 3″·1	17·167
2	1 50 5 ·8	55·060	0 47 44 ·7	23·858	47	44 31 55 ·6	60·228	16 55 13 ·1	16·873
3	2 45 9 ·4	55·078	1 11 36 ·2	23·838	48	45 32 9 ·3	60·578	17 12 5 ·5	16·575
4	3 40 14 ·1	55·098	1 35 26 ·5	23·815	49	46 32 34 ·0	60·593	17 28 40 ·0	16·268
5	4 35 20 ·0	55·120	1 59 15 ·4	23·785	50	47 33 9 ·6	60·773	17 44 56 ·1	15·958
6	5 30 27 ·5	55·156	2 23 2 ·5	23·747	51	48 33 56 ·0	60·958	18 0 53 ·6	15·642
7	6 25 36 ·9	55·193	2 46 47 ·3	23·705	52	49 34 53 ·5	61·138	18 16 32 ·1	15·318
8	7 20 48 ·5	55·235	3 10 29 ·6	23·655	53	50 36 1 ·8	61·318	18 31 51 ·2	14·990
9	8 16 2 ·6	55·283	3 34 8 ·9	23·600	54	51 37 20 ·9	61·500	18 46 50 ·6	14·655
10	9 11 19 ·6	55·335	3 57 44 ·9	23·538	55	52 38 50 ·9	61·678	19 1 29 ·9	14·317
11	10 6 39 ·8	55·393	4 21 17 ·2	23·472	56	53 40 31 ·6	61·857	19 15 48 ·9	13·970
12	11 2 3 ·4	55·455	4 44 45 ·5	23·398	57	54 42 23 ·0	62·031	19 29 47 ·1	13·618
13	11 57 30 ·7	55·525	5 8 9 ·4	23·317	58	55 44 24 ·9	62·207	19 43 24 ·2	13·262
14	12 53 2 ·2	55·597	5 31 28 ·4	23·232	59	56 46 37 ·3	62·377	19 56 39 ·9	12·902
15	13 48 38 ·0	55·673	5 54 42 ·3	23·140	60	57 48 59 ·9	62·548	20 9 34 ·0	12·533
16	14 44 18 ·4	55·757	6 17 50 ·7	23·042	61	58 51 32 ·8	62·715	20 22 6 ·0	12·160
17	15 40 3 ·8	55·845	6 40 53 ·2	22·937	62	59 54 15 ·7	62·878	20 34 15 ·6	11·783
18	16 35 54 ·5	55·937	7 3 49 ·4	22·825	63	60 57 8 ·4	63·040	20 46 2 ·6	11·402
19	17 31 50 ·7	56·033	7 26 38 ·9	22·708	64	62 0 10 ·8	63·198	20 57 26 ·7	11·020
20	18 27 52 ·7	56·135	7 49 21 ·4	22·585	65	63 3 22 ·7	63·352	21 8 27 ·5	10·623
21	19 24 0 ·8	56·267	8 11 56 ·5	22·455	66	64 6 43 ·8	63·502	21 19 4 ·9	10·225
22	20 20 15 ·2	56·352	8 34 23 ·8	22·320	67	65 10 13 ·9	63·647	21 29 18 ·4	9·825
23	21 16 36 ·3	56·467	8 56 43 ·0	22·177	68	66 13 52 ·7	63·790	21 39 7 ·9	9·420
24	22 13 4 ·3	56·587	9 18 53 ·6	22·028	69	67 17 40 ·1	63·927	21 48 33 ·1	9·012
25	23 9 39 ·5	56·708	9 40 55 ·3	21·875	70	68 21 35 ·7	64·058	21 57 33 ·8	8·598
26	24 6 22 ·0	56·837	10 2 47 ·8	21·713	71	69 25 39 ·2	64·185	22 6 9 ·7	8·182
27	25 3 12 ·2	56·968	10 24 30 ·6	21·545	72	70 29 50 ·3	64·307	22 14 20 ·6	7·790
28	26 0 10 ·3	57·103	10 46 3 ·3	21·372	73	71 34 8 ·7	64·425	22 22 6 ·2	7·337
29	26 57 16 ·5	57·243	11 7 25 ·6	21·193	74	72 38 34 ·2	64·533	22 29 26 ·4	6·908
30	27 54 31 ·1	57·385	11 28 37 ·2	21·005	75	73 43 6 ·2	64·638	22 36 20 ·9	6·478
31	28 51 54 ·2	57·532	11 49 37 ·5	20·813	76	74 47 44 ·5	64·722	22 42 49 ·6	6·045
32	29 49 26 ·1	57·682	12 10 26 ·3	20·613	77	75 52 28 ·8	64·830	22 48 52 ·3	5·608
33	30 47 7 ·1	57·835	12 31 3 ·1	20·410	78	76 57 18 ·6	64·915	22 54 28 ·8	5·170
34	31 44 57 ·1	57·992	12 51 27 ·7	20·197	79	78 2 13 ·5	64·997	22 59 39 ·0	4·727
35	32 42 56 ·6	58·148	13 11 39 ·5	19·978	80	79 7 13 ·3	55·067	23 4 22 ·6	4·285
36	33 41 5 ·5	58·312	13 31 38 ·2	19·755	81	80 12 17 ·3	65·135	23 8 39 ·7	3·840
37	34 39 24 ·2	58·477	13 51 23 ·5	19·525	82	81 17 25 ·4	65·192	23 12 30 ·1	3·392
38	35 37 52 ·8	58·645	14 10 55 ·0	19·287	83	82 22 36 ·9	65·243	23 15 53 ·6	2·942
39	36 36 31 ·5	58·812	14 30 12 ·2	19·043	84	83 27 51 ·5	66·288	23 18 50 ·1	2·493
40	37 35 20 ·2	58·985	14 49 14 ·8	18·795	85	84 33 8 ·8	65·327	23 21 19 ·7	2·040
41	38 34 19 ·3	59·016	15 8 2 ·5	18·538	86	85 38 28 ·4	65·355	23 23 22 ·1	1·588
42	39 33 28 ·8	59·333	15 26 34 ·8	18·277	87	86 43 49 ·7	65·378	23 24 57 ·4	1·135
43	40 32 48 ·8	59·510	15 44 51 ·4	18·008	88	87 49 12 ·4	65·393	23 26 5 ·5	0·682
44	41 32 19 ·4	59·687	16 2 51 ·9	17·733	89	88 54 36 ·0	65·400	23 26 46 ·4	0·227
45	42 32 0 ·6	59·868	16 20 35 ·9	17·453	90	90 0 0 ·0	65·400	23 27 0 ·8	0·227

Tables I & II—Right Ascension and Declination of every Ecliptic Degree—(Contd.)

Longitude.	R. A.	Variation of Long. per minute	Decl.	Variation of Decl. per minute	Longitude.	R. A.	Variation of Long. per minute	Decl.	Variation of Decl. per minute
		″	N	−″			″	N	−″
91°	91° 5′ 24″·0	65·393	23° 26′ 46″·4	0·682	136°	138° 27′ 40″·6	59·510	16° 2′ 51″·9	18·008
92	92 10 47 ·6	65·378	23 26 5 ·5	1·135	137	139 27 11 ·2	59·333	15 44 51 ·4	18·277
93	93 16 10 ·3	65·355	23 24 57 ·4	1·588	138	140 26 31 ·2	59·016	15 26 34 ·8	18·538
94	94 21 31 ·6	65·327	23 23 22 ·1	2·040	139	141 25 40 ·7	58·985	15 8 2 ·5	18·795
95	95 26 51 ·2	65·288	23 21 19 ·7	2·493	140	142 24 39 ·8	58·812	14 49 14 ·8	19·043
96	96 32 8 ·5	65·243	23 18 50 ·1	2·942	141	143 23 28 ·5	58·645	14 30 12 ·2	19·287
97	97 37 23 ·1	65·192	23 15 53 ·6	3·392	142	144 22 7 ·2	58·477	14 10 55 ·0	19·525
98	98 42 34 ·6	65·135	23 12 30 ·1	3·840	143	145 20 35 ·8	58·312	13 51 23 ·5	19·755
99	99 47 42 ·7	65·067	23 8 39 ·7	4·285	144	146 18 54 ·5	58·148	13 31 38 ·2	19·978
100	100 52 46 ·7	64·997	23 4 22 ·6	4·727	145	147 17 3 ·4	57·992	13 11 39 ·5	20·197
101	101 57 46 ·5	64·915	22 59 39 ·0	5·170	146	148 15 2 ·9	57·835	12 51 27 ·7	20·410
102	103 2 41 ·4	64·830	22 54 28 ·8	5·608	147	149 12 53 ·0	57·682	12 31 3 ·1	20·613
103	104 7 31 ·2	64·722	22 48 52 ·3	6·045	148	150 10 33 ·9	57·532	12 10 26 ·3	20·813
104	105 12 15 ·5	64·638	22 42 49 ·6	6·478	149	151 8 5 ·8	57·385	11 49 37 ·5	21·005
105	106 16 53 ·8	64·533	22 36 20 ·9	6·908	150	152 5 28 ·9	57·243	11 28 37 ·2	21·193
106	107 21 25 ·8	64·425	22 29 26 ·4	7·337	151	153 2 43 ·5	57·103	11 7 25 .6	21·372
107	108 25 51 ·3	64·307	22 22 6 ·2	7·790	152	153 59 49 ·7	56·968	10 46 3 ·3	21·545
108	109 30 9 ·7	64·185	22 14 20 ·6	8·182	153	154 56 47 ·8	56·837	10 24 30 ·6	21·713
109	110 34 20 ·8	64·058	22 6 9 ·7	8·598	154	155 53 38 ·0	56·708	10 2 47 ·8	21·875
110	111 38 24 ·3	63·927	21 57 33 ·8	9·012	155	156 50 20 ·5	56·587	9 40 55 ·3	22·028
111	112 42 19 ·9	63·790	21 48 33 ·1	9·420	156	157 46 55 ·7	56·467	9 18 53 ·6	22·177
112	113 46 7 ·3	63·647	21 39 7 ·9	9·825	157	158 43 23 ·7	56·352	8 56 43 ·0	22·320
113	114 49 46 ·1	63·502	21 29 18 ·4	10·225	158	159 39 44 ·8	56·267	8 34 23 ·8	22·455
114	115 53 16 ·2	63·352	21 19 4 ·9	10·623	159	160 35 59 ·2	56·135	8 11 56 ·5	22·585
115	116 56 37 ·3	63·198	21 8 27 ·5	11·020	160	161 32 7 ·3	56·033	7 49 21 ·4	22·708
116	117 59 49 ·2	63·040	20 57 26 ·7	11·402	161	162 28 9 ·3	55·937	7 26 38 ·9	22·825
117	119 2 51 ·6	62·878	20 46 2 ·6	11·783	162	163 24 5 ·5	55·845	7 3 49 ·4	22·937
118	120 5 44 ·3	62·715	20 34 15 ·6	12·160	163	164 19 56 ·2	55·757	6 40 53 ·2	23·042
119	121 8 27 ·2	62·548	20 22 6 ·0	12·533	164	165 15 41 ·6	55·673	6 17 50 ·7	23·140
120	122 11 0 ·1	62·377	20 9 34 ·0	12·902	165	166 11 22 ·0	55·597	5 54 42 ·3	23·232
121	123 13 22 ·7	62·207	19 56 39 ·9	13·262	166	167 6 57 ·8	55·525	5 31 28 ·4	23·317
122	124 15 35 ·1	62·031	19 43 24 ·2	13·618	167	168 2 29 ·3	55·455	5 8 9 ·4	23·398
123	125 17 37 ·0	61·857	19 29 47 ·1	13·970	168	168 57 56 ·6	55·393	4 44 45 ·5	23·472
124	126 19 28 ·4	61·678	19 15 48 ·9	14·317	169	169 53 20 ·2	55·335	4 21 17 ·2	23·538
125	127 21 9 ·1	61·500	19 1 29 ·9	14·655	170	170 48 40 ·4	55·283	3 57 44 ·9	23·600
126	128 22 39 ·1	61·318	18 46 50 ·6	14·990	171	171 43 57 ·4	55·235	3 34 8 ·9	23·655
127	129 23 58 ·2	61·138	18 31 51 ·2	15·318	172	172 39 11 ·5	55·193	3 10 29 ·6	23·705
128	130 25 6 ·5	60·958	18 16 32 ·1	15·642	173	173 34 23 ·1	55·156	2 46 47 ·3	23·747
129	131 26 4 ·0	60·773	18 0 53 ·6	15·958	174	174 29 32 ·5	55·120	2 23 2 ·5	23·785
130	132 26 50 ·4	60·593	17 44 56 ·1	16·268	175	175 24 40 ·0	55·098	1 59 15 ·4	23·815
131	133 27 26 ·0	60·578	17 28 40 ·0	16·575	176	176 19 45 ·9	55·078	1 35 26 ·5	23·838
132	134 27 50 ·7	60·228	17 12 5 ·5	16·873	177	177 14 50 ·6	55·060	1 11 36 ·2	23·858
133	135 28 4 ·4	60·048	16 55 13 ·1	17·167	178	178 9 54 ·2	55·052	0 47 44 ·7	23·868
134	136 28 7 ·3	59·868	16 38 3 ·1	17·453	179	179 4 57 ·3	55·045	0 23 52 ·6	23·877 +
135	137 27 59 ·4	59·687	16 20 35 ·9	17·333	180	180 0 ·0	55·045	0 0 0 ·0	23·877

Tables I & II—Right Ascension and Declination of every Ecliptic Degree—(Contd.)

Longitude.	R. A.	Variation of Long. per minute	Decl.	Variation of Decl. per minute	Longitude.	R. A.	Variation of Long. per minute	Decl.	Variation of Decl. per minute
		"	S	+"			"	S	+"
181°	180° 55′ 2″·7	55·052	0° 23′ 52″·6	23·858	226	223° 31′ 52″·7	60·048	16° 38′ 3″·1	17·167
182	181 50 5 ·8	55·060	0 47 44 ·7	23 858	227	224 31 55 ·6	60·228	16 55 13 ·1	16·873
183	182 45 9 ·4	55·078	1 11 36 ·2	23·838	228	225 32 9 3	60·578	17 12 5 ·5	16·575
184	183 40 14 ·1	55·098	1 35 26 ·5	23·815	229	226 32 34 ·0	60·593	17 28 40 ·0	16·268
185	184 35 20 ·0	55·120	1 59 15 ·4	23·785	230	227 33 9 ·6	60·773	17 44 56 ·1	15·958
186	185 30 27 ·5	55·156	2 23 2 ·5	23·747	231	228 33 56 ·0	60 958	18 0 53 ·6	15·642
187	186 25 36 ·9	55·193	2 46 47 ·3	23·705	232	229 34 53 ·5	61·138	18 16 32 ·1	15·318
188	187 20 48 ·5	55·235	3 10 29 ·6	23·655	233	230 36 1 ·8	61·318	18 31 51 ·2	14·990
189	188 16 2 ·6	55·283	3 34 8 ·9	23·600	234	231 37 20 ·9	61·500	18 46 50 ·6	14·655
190	189 11 19 ·6	55·335	3 57 44 ·9	23·538	235	232 38 50 ·9	61·678	19 1 29 ·9	14·317
191	190 6 39 ·8	55·393	4 21 17 ·2	23·472	236	233 40 31 ·6	61·857	19 15 48 ·9	13·970
192	191 2 3 ·4	55·455	4 44 45 ·5	23·398	237	234 42 23 ·0	62·031	19 29 47 ·1	13·618
193	191 57 30 ·7	55·525	5 8 9 ·4	23·317	238	235 44 24 ·9	62·207	19 43 24 ·2	13·262
194	192 53 2 ·2	55·597	5 31 28 ·4	23 232	239	236 46 37 ·3	62·377	19 56 39 ·9	12·902
195	193 48 38 ·0	55·673	5 54 42 ·3	23·140	240	237 48 59 ·9	62·548	20 9 34 ·0	12·533
196	194 44 18 ·4	55·757	6 17 50 ·7	23·042	241	238 51 32 ·8	62·715	20 22 6 ·0	12·160
197	195 40 3 ·8	55·845	6 40 53 ·2	22·937	242	239 54 15 ·7	62·878	20 34 15 ·6	11·783
198	196 35 54 ·5	55·937	7 3 49 ·4	22·825	243	240 57 8 ·4	63·040	20 46 2 ·6	11·402
199	197 31 50 ·7	56·033	7 26 38 ·9	22·708	244	242 0 10 ·8	63 198	20 57 26 ·7	11·020
200	198 27 52 ·7	56·135	7 49 21 ·4	22·585	245	243 3 22 ·7	63·352	21 8 27 ·5	10·623
201	199 24 0 ·8	56·267	8 11 56 ·5	22·455	246	244 6 43 ·8	63·502	21 19 4 ·9	10·225
202	200 20 15 ·2	56·352	8 34 23 ·8	22·320	247	245 10 13 ·9	63·647	21 29 18 ·4	9·825
203	201 16 36 ·3	56·467	8 56 43 ·0	22 177	248	246 13 52 ·7	63·790	21 39 7 ·9	9·420
204	202 13 4 ·3	56·587	9 18 53 ·6	22·028	249	247 17 40 ·1	63·927	21 48 33 ·1	9·012
205	203 9 39 ·5	56·708	9 40 55 ·3	21 875	250	248 21 35 ·7	64 058	21 57 33 ·8	8·598
206	204 6 22 ·0	56·837	10 2 47 ·8	21·713	251	249 25 39 ·2	64·185	22 6 9 ·7	8·182
207	205 3 12 ·2	56·968	10 24 30 ·6	21·545	252	250 29 50 ·3	64 307	22 14 20 ·6	7·790
208	206 0 10 ·3	57·103	10 46 3 ·3	21·372	253	251 34 8 ·7	64·425	22 22 6 ·2	7·337
209	206 57 16 ·5	57·243	11 7 25 ·6	21·193	254	252 38 34 ·2	64·533	22 29 26 ·4	6·908
210	207 54 31 ·1	57·385	11 28 37 ·2	21·005	255	253 43 6 ·2	64·638	22 36 20 ·9	6·478
211	208 51 54 ·2	57·532	11 49 37 ·5	20·813	256	254 47 44 ·5	64·722	22 42 49 ·6	6·045
212	209 49 26 ·1	57·682	12 10 26 ·3	20·613	257	255 52 28 ·8	64·830	22 48 52 ·3	5·608
213	210 47 7 ·0	57·835	12 31 3 ·1	20·410	258	256 57 18 ·6	64·915	22 54 28 ·8	5·170
214	211 44 57 ·1	57·992	12 51 27 ·7	20·197	259	258 2 13 ·5	64·997	22 59 39 ·0	4·727
215	212 42 56 ·6	58·148	13 11 39 ·5	19·978	260	259 7 13 ·3	65·067	23 4 22 ·6	4·285
216	213 41 5 ·5	58·312	13 31 38 ·2	19·755	261	260 12 17 ·3	65·135	23 8 39 ·7	3·840
217	214 39 24 ·2	58·477	13 51 23 ·5	19·525	262	261 17 25 ·4	65·192	23 12 30 ·1	3·392
218	215 37 52 ·8	58·645	14 10 55 ·0	19·287	263	262 22 36 ·9	65 243	23 15 53 ·6	2·942
219	216 36 31 ·5	58·812	14 30 12 ·2	19·043	264	263 27 51 ·5	65·288	23 18 50 ·1	2·493
220	217 35 20 ·2	58·985	14 49 14 ·8	18·795	265	264 33 8 ·8	65·327	23 21 19 ·7	2·040
221	218 34 19 ·3	59·016	15 8 2 ·5	18·538	266	265 38 28 ·4	65·355	23 23 22 ·1	1·588
222	219 33 28 ·8	59·333	15 26 34 ·8	18 277	267	266 43 49 7	65·378	23 24 57 ·4	1·135
223	220 32 48 ·8	59·510	15 44 51 ·4	18·008	268	267 49 12 ·4	65·393	23 26 5 ·5	0·682
224	221 32 19 ·4	59·687	16 2 51 ·9	17·733	269	268 54 36 ·0	65·400	23 26 46 ·4	0·227
225	222 32 0 ·6	59·868	16 20 35 ·9	17 453	270	270 0 ·0	65.400	23 27 0 ·0	0·227

Tables I & II—Right Ascension and Declination of every Ecliptic Degree—(Contd.)

Longitude.	R. A.	Variation of Long. per minute	Decl.	Variation of Decl. per minute	Longitude.	R. A.	Variation of Long. per minute	Decl.	Variation of Decl. per minute
	h m s	″	° ′ ″ S	−″		h m s	″	° ′ ″ S	−″
271°	271° 5′ 24″·0	65·393	23° 26′ 46″·4	0·682	316	318° 27′ 40″·6	59·510	16° 2′ 51″·9	18·008
272	272 10 47 ·6	65·378	23 26 5 ·5	1·135	317	319 27 11 ·2	59·333	15 44 51 ·4	18·277
273	273 16 10 ·3	65·355	23 24 57 ·4	1·588	318	320 26 31 ·2	59·016	15 26 34 ·8	18·538
274	274 21 31 ·6	65·327	23 23 22 ·1	2·040	319	321 25 40 ·7	58·985	15 8 2 ·5	18·795
275	275 26 51 ·2	65·288	23 21 19 ·7	2·493	320	322 24 39 ·8	58·812	14 49 14 ·8	19·043
276	276 32 8 ·5	65·243	23 18 50 ·1	2·942	321	323 23 28 ·5	58·645	14 30 12 ·2	19·287
277	277 37 23 ·1	65·192	23 15 53 ·6	3·392	322	324 22 7 ·2	58·477	14 10 55 ·0	19·525
278	278 42 34 ·6	65·135	23 12 30 ·1	3·840	323	325 20 35 ·8	58·312	13 51 23 ·5	19·755
279	279 47 42 ·7	65·067	23 8 39 ·7	4·285	324	326 18 54 ·5	58·148	13 31 38 ·2	19·978
280	280 52 46 ·7	64·997	23 4 22 ·6	4·727	325	327 17 3 ·4	57·992	13 11 39 ·5	20·197
281	281 57 46 ·5	64·915	22 59 39 ·0	5·170	326	328 15 2 ·9	57·835	12 51 27 ·7	20·410
282	283 2 41 ·4	64·830	22 54 28 ·8	5·608	327	329 12 53 ·0	57·682	12 31 3 ·1	20·613
283	284 7 31 ·2	64·722	22 48 52 ·3	6·045	328	330 10 33 ·9	57·532	12 10 26 ·3	20·813
284	285 12 15 ·5	64·638	22 42 49 ·6	6·478	329	331 8 5 ·8	57·385	11 49 37 ·5	21·005
285	286 16 53 ·8	64·533	22 36 20 ·9	6·908	330	332 5 28 ·9	57·243	11 28 37 2	21·193
286	287 21 25 ·8	64·425	22 29 26 ·4	7·337	331	333 2 43 ·5	57·103	11 7 25 ·6	21·372
287	288 25 51 ·3	64·307	22 22 6 ·2	7·790	332	333 59 49 ·7	56·968	10 46 3 ·3	21·545
288	289 30 9 ·7	64·185	22 14 20 ·6	8·182	333	334 56 47 ·8	56·837	10 24 30 ·6	21·713
289	290 34 20 ·8	64·058	22 6 9 ·7	8·598	334	335 53 38 ·0	56·708	10 2 47 ·8	21·875
290	291 38 24 ·3	63·927	21 57 33 ·8	9·012	335	336 50 20 ·5	56·587	9 40 55 ·3	22·028
291	292 42 19 ·9	63·790	21 48 33 ·1	9·420	336	337 46 55 ·7	56·467	9 18 53 ·6	22·177
292	293 46 7 ·3	63·647	21 39 7 ·9	9·825	337	338 43 23 ·7	56·352	8 56 43 ·0	22·320
293	294 49 46 ·1	63·502	21 29 18 ·4	10·225	338	339 39 44 ·8	56·267	8 34 23 ·8	22·455
294	295 53 16 ·2	63·352	21 19 4 ·9	10·623	339	340 35 59 ·2	56·135	8 11 56 ·5	22·585
295	296 56 37 ·3	63·198	21 8 27 ·5	11·020	340	341 32 7 ·3	56·033	7 49 21 ·4	22·708
296	297 59 49 ·2	63·040	20 57 26 ·7	11·402	341	342 28 9 ·3	55·937	7 26 38 ·9	22·825
297	299 2 51 ·6	62·878	20 46 2 ·6	11·783	342	343 24 5 ·5	55·845	7 3 49 ·4	22·937
298	300 5 44 ·3	62·715	20 34 15 ·6	12·160	343	344 19 56 ·2	55·757	6 40 53 ·2	23·042
299	301 8 27 ·2	62·548	20 22 6 ·0	12·533	344	345 15 41 ·6	55·673	6 17 50 ·7	23·140
300	302 11 0 ·1	62·377	20 9 34 ·0	12·902	345	346 11 22 ·0	55·597	5 54 42 ·3	23·232
301	303 13 22 ·7	62·207	19 56 39 ·9	13·262	346	347 6 57 ·8	55·525	5 31 28 ·4	23·317
302	304 15 35 ·1	62·031	19 43 24 ·2	13·618	347	348 2 29 ·3	55·455	5 8 9 ·4	23·398
303	305 17 37 ·0	61·857	19 29 47 ·1	13·970	348	348 57 56 ·6	55·393	4 44 45 ·5	23·472
304	306 19 28 ·4	61·678	19 15 48 ·9	14·317	349	349 53 20 ·2	55·335	4 21 17 ·2	23·538
305	307 21 9 ·1	61·500	19 1 29 ·9	14·655	350	350 48 40 ·4	55·283	3 57 44 ·9	23·600
306	308 22 39 ·1	61·318	18 46 50 ·6	14·990	351	351 43 57 ·4	55·235	3 34 8 ·9	23·655
307	309 23 58 ·2	61·138	18 31 51 ·2	15·318	352	352 39 11 ·5	55·193	3 10 29 ·6	23·705
308	310 25 6 ·5	60·958	18 16 32 ·1	15·642	353	353 34 23 ·1	55·156	2 46 47 ·3	23·747
309	311 26 4 ·0	60·773	18 0 53 ·6	15·958	354	354 29 32 ·5	55·120	2 23 2 ·5	23·785
310	312 26 50 ·4	60·593	17 44 56 ·1	16·268	355	355 24 40 ·0	55·098	1 59 15 ·4	23·815
311	313 27 26 ·0	60·578	17 28 40 ·0	16·575	356	356 19 45 ·9	55·078	1 35 26 ·5	23·838
312	314 27 50 ·7	60·228	17 12 5 ·5	16·873	357	357 14 50 ·6	55·060	1 11 36 ·2	23·858
313	315 28 4 ·4	60·048	16 55 13 ·1	17·167	358	358 9 54 ·2	55·052	0 47 44 ·7	23·868
314	316 28 7 ·3	59·868	16 38 3 ·1	17·453	359	359 4 57 ·3	55·045	0 23 52 ·6	23·877 +
315	317 27 59 ·4	59·687	16 20 35 ·9	17·733	360	360 0 ·0	55·045	0 0 0 ·0	23·877

Table III—Ascensional Difference of every Ecliptic Degree at every Degree of Terrestrial Latitude

Lat.	0	1, 179	2, 178	3, 177	4, 176	5, 175	6, 174	7, 173	8, 172	9, 171	10, 170
	180	181, 359	182, 358	183, 357	184, 356	185, 355	186, 354	187, 353	188, 352	189, 351	190, 350
0°	0° 0′	0° 0′0	0° 0′0	0° 0′0	0° 0′0	0° 0′0	0° 0′0	0° 0′0	0° 0′0	0° 0′0	0° 0′0
1	0 0	0·4	0·8	1·3	1·7	2·1	2·5	2·9	3·3	3·7	4·2
2	0 0	0·8	1·7	2·5	3·3	4·2	5·0	5·8	6·7	7·5	8·3
3	0 0	1·3	2·5	3·8	5·0	6·3	7·5	8·7	10·0	11·2	12·5
4	0 0	1·7	3·3	5·0	6·7	8·3	10·0	11·7	13·3	15·0	16·7
5	0 0	2·1	4·2	6·3	8·4	10·4	12·5	14·6	16·7	18·8	20·8
6	0 0	2·5	5·0	7·5	10·0	12·5	15·0	17·5	20·0	22·5	25·0
7	0 0	2·9	5·9	8·8	11·7	14·6	17·6	20·5	23·4	26·3	29·2
8	0 0	3·3	6·7	10·1	13·4	16·8	20·1	23·5	26·8	30·1	33·5
9	0 0	3·8	7·6	11·3	15·1	18·9	22·7	26·4	30·2	34·0	37·7
10	0 0	4·2	8·4	12·6	16·8	21·0	25·2	29·4	33·6	37·8	42·0
11	0 0	4·6	9·3	13·9	18·6	23·2	27·8	32·4	37·1	41·7	46·3
12	0 0	5·1	10·1	15·2	20·3	25·4	30·4	35·5	40·5	45·6	50·6
13	0 0	5·5	11·0	16·5	22·0	27·5	33·0	38·5	44·0	49·5	55·0
14	0 0	6·0	11·9	17·9	23·8	29·7	35·7	41·6	47·5	53·5	59·4
15	0 0	6·4	12·8	19·2	25·6	32·0	38·4	44·7	51·1	57·5	1° 3·8
16	0 0	6·8	13·7	20·5	27·4	34·2	41·0	47·9	54·7	1 1·5	8·3
17	0 0	7·3	14·6	21·9	29·2	36·5	43·8	51·0	58·3	5·6	12·8
18	0 0	7·8	15·5	23·3	31·0	38·8	46·5	54·2	1 2·0	9·7	17·4
19	0 0	8·2	16·4	24·7	32·9	41·1	49·3	57·5	5·7	13·8	22·0
20	0 0	8·7	17·4	26·1	34·7	43·4	52·1	1 0·8	9·4	18·1	26·7
21	0 0	9·2	18·3	27·5	36·6	45·8	54·9	4·1	13·2	22·3	31·4
22	0 0	9·6	19·3	28·9	38·6	48·2	57·8	7·4	17·0	26·6	36·2
23	0 0	10·1	20·3	30·4	40·5	50·6	1 0·8	10·9	20·9	31·0	41·1
24	0 0	10·6	21·3	31·9	42·5	53·1	3·7	14·3	24·9	35·5	46·0
25	0 0	11·1	22·3	33·4	44·5	55·6	6·7	1 17·8	28·9	40·0	51·1
26	0 0	11·6	23·3	34·9	46·6	58·2	9·8	21·4	33·0	44·6	56·2
27	0 0	12·2	24·3	36·5	48·6	1 0·8	12·9	25·1	37·2	49·3	2 1·4
28	0 0	12·7	25·4	38·1	50·8	3·4	16·1	28·8	41·4	54·0	6·6
29	0 0	13·2	26·5	39·7	52·9	6·1	19·3	32·5	45·7	58·9	12·0
30	0 0	13·8	27·6	41·3	55·2	8·9	22·6	36·4	50·1	2 3·8	17·5
31	0 0	14·3	28·7	43·0	57·4	11·7	26·0	40·3	54·6	8·9	23·1
32	0 0	14·9	29·8	44·8	59·7	14·6	29·4	44·3	59·2	14·0	28·8
33	0 0	15·5	31·0	46·5	2·0	17·5	33·0	48·4	3·9	19·3	34·7

Table III—Ascensional Difference of every Ecliptic Degree at every Degree of Terrestrial Latitude—(Contd.)

Lat.	0	1, 179	2, 178	3, 177	4, 176	5, 175	6, 174	7, 173	8, 172	9, 171	10, 170
	180	181, 359	182, 358	183, 357	184, 356	185, 355	186, 354	187, 353	188, 352	189, 351	190, 350
34°	0° 0′	0° 16′·1	0° 32′·2	0° 48′·3	1° 4′·4	1° 20′·5	1° 36′·6	1° 52′·6	2° 8′·7	2° 24′·7	2° 40′·7
35	0 0	16·7	33·4	50·1	6·9	23·5	40·2	56·9	13·6	30·2	46·8
36	0 0	17·3	34·7	52·0	9·4	26·7	44·0	2 1·3	18·6	35·8	53·1
37	0 0	18·0	36·0	54·0	11·9	29·9	47·9	5·8	23·7	41·6	59·5
38	0 0	18·7	37·3	56·0	14·6	33·2	51·8	10·4	29·0	47·6	3 6·1
39	0 0	19·3	38·7	58·0	17·3	36·6	55·9	15·2	34·5	53·7	12·9
40	0 0	20·0	40·1	1 0·1	20·1	40·1	2 0·1	20·1	40·1	3 0·0	19·9
41	0 0	20·8	41·5	2·3	23·0	43·7	4·4	25·1	45·8	6·5	27·1
42	0 0	21·5	43·0	4·5	26·0	47·4	8·9	30·3	51·8	13·2	34·6
43	0 0	22·3	44·5	6·8	29·0	51·3	13·5	35·7	57·9	20·1	42·2
44	0 0	23·1	46·1	9·2	32·2	55·2	18·3	41·3	3 4·2	27·2	50·1
45	0 0	23·9	47·7	11·6	35·5	59·3	23·2	47·0	10·8	34·6	58·3
46	0 0	24·7	49·4	14·2	38·9	2 3·6	28·3	52·9	17·6	42·2	4 6·8
47	0 0	25·6	51·2	16·8	42·4	8·0	33·5	59·1	24·6	50·1	15·6
48	0 0	26·5	53·0	19·5	46·0	12·5	39·0	3 5·5	31·9	58·3	24·7
49	0 0	27·5	54·9	22·4	49·8	17·3	44·7	12·1	39·5	4 6·9	34·2
50	0 0	28·5	56·9	25·4	53·8	22·2	50·6	19·0	47·4	15·8	44·1
51	0 0	29·5	59·0	28·4	57·9	27·4	56·8	26·3	55·7	25·1	54·4
52	0 0	30·6	1 1·1	31·7	2 2·2	32·8	3 3·3	33·8	4 4·3	34·7	5 5·2
53	0 0	31·7	3·4	35·0	6·7	38·4	10·0	41·7	13·3	44·9	16·5
54	0 0	32·9	5·7	38·6	11·4	44·3	17·1	49·9	22·7	55·5	28·3
55	0 0	34·1	8·2	42·3	16·4	50·5	24·5	58·6	32·6	5 6·6	40·6
56	0 0	35·4	10·8	46·2	21·6	57·0	32·3	4 7·7	43·0	18·4	53·7
57	0 0	36·8	13·5	50·3	27·1	3 3·8	40·5	17·3	54·0	30·7	6 7·4
58	0 0	38·2	16·4	54·6	32·8	11·0	49·2	27·4	5 5·6	43·7	21·9
59	0 0	39·7	19·5	59·2	38·9	18·7	58·4	38·1	17·8	57·5	37·2
60	0 0	41·4	22·7	2 4·1	45·4	26·8	4 8·1	49·5	30·8	6 12·1	53·4
61	0 0	43·1	26·2	9·2	52·3	35·4	18·4	5 1·5	44·6	27·7	7 10·7
62	0 0	44·9	29·8	14·7	59·6	44·5	29·5	14·4	59·3	44·2	29·1
63	0 0	46·9	33·7	20·6	3 7·5	54·3	41·2	28·1	6 15·0	7 1·9	48·8
64	0 0	49·0	37·9	26·9	15·8	4 4·8	53·8	42·8	31·8	20·8	8 9·9
65	0 0	51·2	42·4	33·6	24·9	16·1	5 7·3	58·6	49·9	41·2	32·6
66	0 0	53·6	47·3	40·9	34·6	28·2	21·9	6 15·7	7 9·4	8 3·2	57·0
66°·23′	0 0	55·0	50·1	45·2	40·3	35·3	30·5	25·6	20·8	16·0	9 11·3

Table III—Ascensional Difference of every Ecliptic Degree at every Degree of Terrestrial Latitude—(Contd).

Lat.	11, 169 191, 349	12, 168 192, 348	13, 167 193, 347	14, 166 194, 346	15, 165 195, 345	16, 164 196, 344	17, 163 197, 343	18, 162 198, 342	19, 161 199, 341	20, 160 200, 340
0°	0° 0'0	0° 0'0	0° 0'0	0° 0'0	0° 0'0	0° 0'0	0° 0'0	0° 0'0	0° 0'0	0° 0'0
1	4'6	5'0	5'4	5'8	6'2	6'6	7'0	7'4	7'8	8'2
2	9'1	10'0	10'8	11'6	12'4	13'2	14'1	14'9	15'7	16'5
3	13'7	15'0	16'2	17'4	18'7	19'9	21'1	22'3	23'5	24'8
4	18'3	20'0	21'6	23'3	24'9	26'5	28'2	29'8	31'4	33'0
5	22'9	25'0	27'0	29'1	31'1	33'2	35'2	37'3	39'3	41'3
6	27'5	30'0	32'5	34'9	37'4	39'9	42'3	44'8	47'2	49'6
7	32'1	35'0	37'9	40'8	43'7	46'6	49'4	52'3	55'2	58'0
8	36'8	40'1	43'4	46'7	50'0	53'3	56'6	59'9	1 3'1	1 6'4
9	41'5	45'2	48'9	52'7	56'4	1 0'1	1 3'8	1 7'5	11'1	14'8
10	46'2	50'3	54'5	58'6	1 2'8	6'9	11'0	15'1	19'2	23'3
11	50'9	55'5	1 0'1	1 4'6	9'2	13'7	18'3	22'8	27'3	31'8
12	55'6	1 0'7	5'7	10'7	15'7	20'6	25'6	30'6	35'5	40'4
13	1 0'4	5'9	11'3	16'8	22'2	27'6	33'0	38'4	43'7	49'1
14	5'3	11'2	17'0	22'9	28'8	34'6	40'4	46'2	52'0	57'8
15	10'2	16'5	22'8	29'1	35'4	41'7	47'9	54'2	2 0'4	2 6'6
16	15'1	21'8	28'6	35'4	42'1	48'8	55'5	2 2'2	8'8	15'5
17	20'0	27'3	34'5	41'7	48'8	56'0	2 3'1	10'3	17'4	24'4
18	25'1	32'7	40'4	48'1	55'7	2 3'3	10'9	18'4	26'0	33'5
19	30'2	38'3	46'4	54'5	2 2'6	10'7	18'7	26'7	34'7	42'7
20	35'3	43'9	52'5	2 1'0	9'6	18'1	26'6	35'1	43'5	52'0
21	40'5	49'6	58'6	7'7	16'6	25'7	34'6	43'6	52'5	3 1'4
22	45'8	55'4	2 4'9	14'4	23'9	33'3	42'8	52'2	3 1'6	10'9
23	51'1	2 1'2	11'2	21'2	31'1	41'1	51'0	3 0'9	10'8	20'6
24	56'6	7'1	17'6	28'1	38'5	49'0	59'4	9'8	20'1	30'4
25	2 2'1	13'1	24'1	35'1	46'1	57'0	3 7'9	18'7	29'6	40'4
26	7'7	19'2	30'7	42'2	53'7	3 5'1	16'5	27'9	39'2	50'5
27	13'4	25'5	37'5	49'5	3 1'5	13'4	25'3	37'2	49'0	4 0'8
28	19'2	31'8	44'4	56'9	9'4	21'8	34'3	46'7	59'0	11'3
29	25'2	38'3	51'3	3 4'4	17'4	30'4	43'4	56'3	4 9'2	22'1
30	31'2	44'8	58'5	12'1	25'6	39'2	52'7	4 6'2	19'6	33'0
31	37'4	51'6	3 5'7	19'9	34'0	48'1	4 2'2	16'2	30'2	44'1
32	43'6	58'4	13'2	27'9	42'6	57'2	11'9	26'5	41'0	55'5
33	50'1	3 5'4	20'8	36'1	51'3	4 6'6	21'8	36'9	55'8	5 10'9

Table III—Ascensional Difference of every Ecliptic Degree at every Degree of Terrestrial Latitude—(Contd.)

Lat.	11, 169 191, 349	12, 168 192, 348	13, 167 193, 347	14, 166 194, 346	15, 165 195, 345	16, 164 196, 344	17, 163 197, 343	18, 162 198, 342	19, 161 199, 341	20, 160 200, 340
34°	2° 56′·7	3° 12′·6	3° 28′·5	3° 44′·4	4° 0′·3	4° 16′·1	4° 31′·9	4° 47′·7	5° 7′·3	5° 22′·9
35	3 3·4	20·0	36·5	53·0	9·5	25·9	42·3	58·7	19·0	35·3
36	10·3	27·5	44·6	4 1·8	18·9	35·9	52·9	5 9·9	31·1	47·9
37	17·4	35·2	53·0	10·8	28·5	46·2	5 3·9	21·5	43·4	6 0·9
38	24·7	43·1	4 1·6	20·0	38·4	56·8	15·1	33·3	56·1	14·2
39	32·1	51·3	10·4	29·5	48·6	5 7·6	26·6	45·5	6 9·1	27·9
40	39·8	59·7	19·5	39·3	59·1	18·8	38·5	58·1	22·6	42·1
41	47·7	4 8·3	28·9	49·4	5 9·9	30·3	50·7	6 11·0	31·3	51·5
42	55·9	17·2	38·5	59·8	21·0	42·2	6 3·3	24·4	45·4	7 6·3
43	4 4·3	26·4	48·5	5 10·5	32·5	54·4	16·3	38·1	59·9	21·6
44	13·0	35·9	58·8	21·6	44·3	6 7·1	29·7	52·4	7 14·9	37·4
45	22·0	45·7	5 9·4	33·0	56·6	20·1	43·6	7 7·1	30·5	53·8
46	31·4	55·9	20·4	44·9	6 9·3	33·7	58·1	22·3	46·6	8 10·7
47	41·0	5 6·5	31·9	57·2	22·5	47·8	7 13·0	38·2	8 3·3	28·3
48	51·1	17·4	43·7	6 10·0	36·2	7 2·4	28·5	54·6	20·6	46·6
49	5 1·5	28·8	56·1	23·3	50·5	17·6	44·7	8 11·7	38·7	9 5·6
50	12·4	40·7	6 8·9	37·1	7 5·3	33·4	8 1·5	29·5	57·5	25·4
51	23·8	53·1	22·4	51·6	20·8	50·0	19·1	48·2	9 17·1	46·1
52	35·6	6 6·0	36·4	7 6·7	37·0	8 7·2	37·4	9 7·5	37·6	10 7·7
53	48·0	19·5	51·0	22·5	53·9	25·3	56·6	27·9	59·1	30·3
54	6 1·0	33·7	7 6·4	39·0	8 11·6	44·2	9 16·7	49·2	10 21·6	54·0
55	14·6	48·6	22·5	56·4	30·2	9 4·1	37·9	10 11·6	45·3	11 18·9
56	29·0	7 4·2	39·5	8 14·7	49·8	25·0	10 0·1	35·2	11 10·2	45·1
57	44·1	20·7	57·3	33·9	9 10·5	47·0	23·5	11 0·0	36·4	12 12·8
58	7 0·0	38·1	8 16·2	54·3	32·3	10 10·3	48·3	26·3	12 4·2	42·1
59	16·9	56·5	36·2	9 15·8	55·4	35·0	11 14·5	54·1	33·6	13 13·0
60	34·8	8 16·1	57·4	38·6	10 19·9	11 1·2	42·4	12 23·6	13 4·8	46·0
61	53·8	36·8	9 19·9	10 2·9	46·0	29·0	12 12·0	55·0	38·0	14 21·0
62	8 14·1	59·0	43·9	28·9	11 13·8	58·7	43·7	13 28·6	14 13·5	58·4
63	35·7	9 22·7	10 9·6	56·6	43·5	12 30·5	13 17·5	14 4·5	51·5	15 38·5
64	59·0	48·0	37·2	11 26·3	12 15·4	13 4·6	53·8	43·1	15 32·3	16 21·6
65	9 23·9	10 15·3	11 6·8	58·3	49·8	41·4	14 33·0	15 24·6	16 16·3	17 8·1
66	50·9	44·8	38·8	12 32·8	13 26·9	14 21·1	15 15·3	16 9·6	17 3·9	58·4
66°·23′	10 6·7	11 2·1	57·5	53·0	48·6	44·3	40·1	35·9	31·8	18 27·9

Table III—Ascensional Difference of every Ecliptic Degree at every Degree of Terrestrial Latitude—(Contd).

Lat.	21, 159 201, 339	22, 158 202, 338	23, 157 203, 337	24, 156 204, 336	25, 155 205, 335	26, 154 206, 334	27, 153 207, 333	28, 152 208, 332	29, 151 209, 331	30, 150 210, 330
0°	0° 0′0	0° 0′0	0° 0′0	0° 0′0	0° 0′0	0° 0′0	0° 0′0	0° 0′0	0° 0′0	0° 0′0
1	8′6	9′0	9′4	9′8	10′2	10′6	11′0	11′4	11′8	12′2
2	17′3	18′1	18′9	19′7	20′5	21′3	22′1	22′8	23′6	24′4
3	26′0	27′2	28′4	29′6	30′7	31′9	33′1	34′3	35′4	36′6
4	34′6	36′2	37′8	39′4	41′0	42′6	44′2	45′7	47′3	48′8
5	43′3	43′3	47′3	49′3	51′3	53′3	55′2	57′2	59′2	1 1′1
6	52′1	54′5	56′9	59′3	1 1′6	1 4′0	1 6′4	1 8′7	1 11′0	13′4
7	1 0′8	1 3′6	1 6′4	1 9′2	12′0	14′8	17′5	20′3	23′0	25′7
8	9′6	12′8	16′1	19′3	22′4	25′6	28′8	31′9	35′0	38′1
9	18′5	22′1	25′7	29′3	32′9	36′5	40′0	43′6	47′1	50′6
10	27′3	31′4	35′4	39′4	43′4	47′4	51′4	55′3	59′2	2 3′1
11	36′3	40′8	45′2	49′6	54′0	58′4	2 2′8	2 7′1	2 11′4	15′7
12	45′3	50′2	55′0	59′9	2 4′7	2 9′5	14′3	19′0	23′7	28′4
13	54′4	59′7	2 5′0	2 10′2	15′4	20′6	25′8	31′0	36′1	41′2
14	2 3′5	2 9′2	15′0	20′6	26′3	31′9	37′5	43′1	48′6	54′1
15	12′8	18′9	25′0	31′1	37′2	43′3	49′3	55′3	3 1′2	3 7′1
16	22′1	28′7	35′2	41′7	48′2	54′7	3 1′2	3 7′6	13′9	20′3
17	31′5	38′5	45′5	52′5	59′4	3 6′3	13′2	20′0	26′8	33′5
18	41′0	48′5	55′9	3 3′3	3 10′7	18′0	25′3	32′6	39′8	47′0
19	50′6	58′5	3 6′4	14′3	22′1	29′8	37′6	45′3	52′9	4 0′5
20	3 0′4	3 8′7	17′1	25′4	33′6	41′8	50′0	58′1	4 6′2	14′3
21	10′2	19′1	27′8	36′6	45′3	54′0	4 2′6	4 11′2	19′7	28′2
22	20′2	29′5	38′8	48′0	57′2	4 6′3	15′4	24′4	33′4	42′3
23	30′4	40′1	49′9	59′5	4 9′2	18′8	28′3	37′8	47′3	56′6
24	40′7	50′9	4 1′1	4 11′3	21′4	31′4	41′5	51′4	5 1′3	5 11′2
25	51′1	4 1′9	12′6	23′2	33′8	44′3	54′8	5 5′3	15′6	26′0
26	4 1′8	13′0	24′2	35′3	46′4	57′4	5 8′4	19′3	30′2	41′0
27	12′6	24′3	36′0	47′6	59′2	5 10′8	22′2	33′6	45′0	56′3
28	23′6	35′9	48′1	5 0′2	5 12′3	24′3	36′3	48′2	6 0′1	6 11′8
29	34′9	47′6	5 0′3	13′0	25′6	38′1	50′6	6 3′1	15′4	27′7
30	46′3	59′6	12′8	26′0	39′2	52′3	6 5′3	18′2	31′1	43′9
31	58′0	5 11′8	25′6	39′4	53′0	6 6′6	20′2	33′7	47′1	7 0′4
32	5 9′9	24′3	38′7	53′0	6 7′2	21′4	35′5	49′5	7 3′4	17′3
33	25′9	40′8	55′7	6 10′6	25′4	40′1	54′7	7 9′3	23′8	38′2

Table III—Ascensional Difference of every Ecliptic Degree at every Degree of Terrestrial Latitude—(Contd.)

Lat.	21, 159 201, 339	22, 158 202, 338	23, 157 203, 337	24, 156 204, 336	25, 155 205, 335	26, 154 206, 334	27, 153 207, 333	28, 152 208, 332	29, 151 209, 331	30, 150 210, 330
34°	5° 38′·5	5° 54′·1	6° 9′·5	6° 25′·0	6° 40′·3	6° 55′·6	7° 10′·8	7° 26′·0	7° 41′·0	7° 56′·0
35	51·5	6 7·6	23·7	39·7	55·6	7 11·5	27·3	43·1	58·7	8 14·3
36	6 4·7	21·5	38·2	54·8	7 11·4	27·8	44·3	8 0·6	8 16·8	33·0
37	18·3	35·7	53·0	7 10·3	27·5	44·6	8 1·6	18·6	35·4	52·2
38	32·3	50·4	7 8·3	26·2	44·1	8 1·8	19·5	37·1	54·6	9 12·0
39	46·7	7 5·4	24·0	42·6	8 1·1	19·5	37·8	56·1	9 14·2	32·3
40	7 1·5	20·9	40·2	59·5	18·6	37·7	56·7	9 15·7	34·5	53·2
41	11·7	31·8	51·9	8 11·8	31·8	51·6	9 11·3	30·9	50·5	10 9·9
42	27·3	48·1	8 8·9	29·6	50·2	9 10·7	31·2	51·6	10 11·8	32·0
43	43·3	8 4·9	26·4	47·9	9 9·3	30·6	51·8	10 12·9	33·9	54·8
44	59·9	22·3	44·6	9 6·8	29·0	51·1	10 13·0	34·9	56·7	11 18·4
45	8 17·1	40·3	9 3·4	26·4	49·4	10 12·3	35·1	57·8	11 20·4	42·9
46	34·8	58·9	22·9	46·7	10 10·6	34·3	57·9	11 21·5	44·9	12 8·2
47	53·3	9 18·2	43·1	10 7·8	32·5	57·1	11 21·6	46·0	12 10·3	34·5
48	9 12·5	38·3	10 4·1	29·8	55·4	11 20·9	46·3	12 11·6	36·8	13 1·9
49	32·5	59·2	25·9	52·6	11 19·1	45·6	12 11·9	38·2	13 4·4	30·4
50	53·2	10 21·0	48·7	11 16·3	43·9	12 11·3	38·7	13 6·0	33·1	14 0·2
51	10 15·0	43·8	11 12·5	41·2	12 9·8	38·2	13 6·6	35·0	14 3·1	31·2
52	37·6	11 7·5	37·4	12 7·1	36·8	13 6·4	35·9	14 5·3	34·6	15 3·7
53	11 1·4	32·4	12 3·4	34·3	13 5·1	35·9	14 6·5	37·1	15 7·5	37·8
54	26·3	58·6	30·7	13 2·8	34·9	14 6·8	38·7	15 10·4	42·1	16 13·7
55	52·5	12 26·0	59·5	32·8	14 6·1	39·4	15 12·5	45·6	16 18·5	51·3
56	12 20·1	54·9	13 29·7	14 4·4	39·1	15 13·7	48·2	16 22·6	56·9	17 31·1
57	49·1	13 25·4	14 1·6	37·8	15 13·9	49·9	16 25·8	17 1·7	17 37·5	18 13·1
58	13 19·9	57·7	35·4	15 13·1	50·7	16 28·2	17 5·7	43·1	18 20·4	57·7
59	52·5	14 31·9	15 11·2	50·5	16 29·7	17 8·9	48·0	18 27·1	19 6·1	19 44·9
60	14 27·1	15 8·2	49·3	16 30·3	17 11·3	52·2	18 33·1	19 13·9	54·7	20 35·4
61	15 4·0	46·9	16 29·8	17 12·7	55·6	18 38·4	19 21·2	20 3·9	20 46·6	21 29·2
62	43·4	16 28·3	17 13·2	58·1	18 42·9	19 27·8	20 12·6	57·4	21 42·2	22 26·9
63	16 25·6	17 12·6	59·7	18 46·7	19 33·8	20 20·8	21 7·9	21 54·9	22 42·0	23 29·0
64	17 11·0	18 0·3	18 49·7	19 39·1	20 28·5	21 18·0	22 7·5	22 57·0	23 46·5	24 36·0
65	59·9	51·8	19 43·7	20 35·7	21 27·7	22 19·8	23 11·9	24 4·1	24 56·4	25 48·7
66	18 52·9	19 47·5	20 42·2	21 37·0	22 31·9	23 26·9	24 22·0	25 17·2	26 12·5	27 7·8
66°33′	19 24·0	20 20·3	21 16·6	22 13·1	23 9·7	24 6·4	25 3·2	26 0·2	57·3	54·5

Table III—Ascensional Difference of every Ecliptic Degree at every Degree of Terrestrial Latitude—(Contd.)

Lat.	31, 149 211, 329	32, 148 212, 328	33, 147 213, 327	34, 146 214, 326	35, 145 215, 325	36, 144 216, 324	37, 143 217, 323	38, 142 218, 322	39, 141 219, 321	40, 140 220, 320
0°	0° 0′·0	0° 0′·0	0° 0′·0	0° 0′·0	0° 0′·0	0° 0′·0	0° 0′·0	0° 0′·0	0° 0′·0	0° 0′·0
1	12·6	12·9	13·3	13·7	14·1	14·4	14·8	15·2	15·5	15·9
2	25·1	25·9	26·7	27·4	28·1	28·9	29·6	30·3	31·1	31·8
3	37·7	38·9	40·0	41·1	42·2	43·3	44·4	45·5	46·6	47·7
4	50·3	51·9	53·4	54·9	56·4	57·8	59·3	1 0·8	1 2·2	1 3·6
5	1 3·0	1 4·9	1 6·8	1 8·7	1 10·5	1 12·4	1 14·2	16·0	17·8	19·6
6	15·7	18·0	20·2	22·5	24·7	26·9	29·1	31·3	33·5	35·6
7	28·4	31·1	33·7	36·4	39·0	41·6	44·1	46·7	49·2	51·7
8	41·2	44·2	47·3	50·3	53·3	56·3	59·2	2 2·1	2 5·0	2 7·9
9	54·0	57·5	2 0·9	2 4·3	2 7·7	2 11·0	2 14·3	17·6	20·9	24·1
10	2 7·0	2 10.8	14·6	18·4	22·2	25·9	29·6	33·2	36·9	40·4
11	20·0	24·2	28·4	32·6	36·7	40·8	44·9	48·9	52·9	56·9
12	33·1	37·7	42·3	46·9	51·4	55·9	3 0·3	3 4·7	3 9·1	3 13·4
13	46·3	51·3	56·3	3 1·2	3 6·2	3 11·0	15·9	20·7	25·4	30·1
14	59·6	3 5·0	3 10·4	15·7	21·1	26·3	31·6	36·7	41·9	47·0
15	3 13·0	18·8	24·6	30·4	36·1	41·8	47·4	53·0	58·5	4 3·9
16	26·5	32·8	39·0	45·2	51·3	57·3	4 3·4	4 9·3	4 15·2	21·1
17	40·2	46·9	53·5	4 0·1	4 6·6	4 13·1	19·5	25·9	32·2	38·4
18	54·1	4 1·2	4 8·2	15·2	22·1	29·0	35·8	42·6	49·3	55·9
19	4 8·1	15·6	23·1	30·5	37·8	45·1	52·3	59·5	5 6·6	5 13·6
20	22·3	30·2	38·1	45·9	53·7	5 1·4	5 9·1	5 16·6	24·2	31·6
21	36·6	45·0	53·3	5 1·6	5 9·8	17·9	26·0	34·0	41·9	49·8
22	51·2	5 0·0	5 8·8	17·5	26·1	34·7	43·2	51·6	59·9	6 8·2
23	5 6·0	15·2	24·5	33·6	42·7	51·7	6 0·6	6 9·5	6 18·2	26·9
24	21·0	30·7	40·4	50·0	59·5	6 8·9	18·3	27·6	36·8	45·9
25	36·2	46·4	56·5	6 6·6	6 16·6	26·5	36·3	46·0	55·7	7 5·2
26	51·7	6 2·4	6 13·0	23·5	34·0	44·3	54·6	7 4·8	7 14·9	24·9
27	6 7·5	18·6	29·7	40·7	51·6	7 2·5	7 13·2	23·9	34·4	44·9
28	23·6	35·2	46·8	58·3	7 9·7	21·0	32·2	43·3	54·3	8 5·3
29	39·9	52·1	7 4·1	7 16·1	28·0	39·8	51·5	8 3·1	8 14·6	26·0
30	56·6	7 9·3	21·9	34·4	46·8	59·1	8 11·3	23·4	35·4	47·2
31	7 13·7	26·9	40·0	53·0	8 5·9	8 18·7	31·4	44·0	56·5	9 8·9
32	31·1	44·8	58·5	8 12·0	25·4	38·8	52·0	9 5·1	9 18·1	31·0
33	52·5	8 3.2	8 17·4	31·5	45·4	59·3	9 13·1	26·7	40·3	53·7

Table III—Ascensional Difference of every Ecliptic Degree at every Degree of Terrestrial Latitude—(Contd.)

Lat.	31, 149 211, 329	32, 148 212, 328	33, 147 213, 327	34, 146 214, 326	35, 145 215, 325	36, 144 216, 324	37, 143 217, 323	38, 142 218, 322	39, 141 219, 321	40, 140 220, 320
34°	8° 10′·9	8° 22′·0	8° 36′·8	8° 51′·4	9° 5′·9	9° 20′·3	9° 34′·6	9° 48′·8	10° 2′·9	10° 16′·9
35	29·7	41·3	56·6	9 11·8	26·9	41·9	56·8	10 11·5	26·1	40·6
36	49·1	9 1·1	9 17·0	32·7	48·4	10 4·0	10 19·4	34·8	50·0	11 5·0
37	9 8·9	21·4	37·9	54·3	10 10·5	26·7	42·7	58·7	11 14·4	30·1
38	29·3	42·2	59·3	10 16·4	33·3	50·0	11 6·7	11 23·2	39·6	55·8
39	50·3	10 3·7	10 21·4	39·1	56·6	11 14·1	31·3	48·5	12 5·5	12 22·4
40	10 11·9	25·8	44·2	11 2·5	11 20·7	38·8	56·7	12 14·5	32·2	49·7
41	29·3	48·5	11 7·7	26·7	45·5	12 4·3	12 22·9	41·4	59·7	13 17·9
42	52·1	11 12·0	31·9	51·6	12 11·2	30·6	50·0	13 9·1	13 28·1	47·0
43	11 15·6	36·3	56·9	12 17·4	37·7	57·9	13 17·9	37·8	57·5	14 17·1
44	40·0	12 1·5	12 22·8	44·0	13 5·1	13 26·0	46·8	14 7·5	14 28·0	48·3
45	12 5·2	27·5	49·6	13 11·7	33·5	55·3	14 16·8	38·3	59·5	15 20·6
46	31·4	54·5	13 17·5	40·3	14 3·0	14 25·6	48·0	15 10·2	15 32·3	54·1
47	58·6	13 22·6	46·4	14 10·1	33·7	57·1	15 20·3	43·4	16 6·3	16 29·0
48	13 26·9	51·8	14 16·5	41·1	15 5·5	15 29·8	54·0	16 18·0	41·8	17 5·4
49	56·4	14 22·2	47·8	15 13·4	38·8	16 4·0	16 29·1	54·0	17 18·7	43·3
50	14 27·1	53·9	15 20·5	47·1	16 13·5	39·7	17 5·7	17 31·6	57·3	18 22·9
51	59·2	15 27·0	54·7	16 22·3	49·7	17 17·0	44·1	18 11·0	18 37·8	19 4·3
52	15 32·8	16 1·7	16 30·5	59·2	17 27·7	56·1	18 24·3	52·3	19 20·1	47·8
53	16 8·1	38·1	17 8·1	17 37·9	18 7·6	18 37·1	19 6·5	19 35·6	20 4·6	20 33·4
54	45·1	17 16·4	47·6	18 18·6	49·5	19 20·3	50·8	20 21·2	51·4	21 21·5
55	17 24·1	56·7	18 29·2	19 1·5	19 33·7	20 5·7	20 37·6	21 9·3	21 40·8	22 12·2
56	18 5·2	18 39·2	19 13·0	46·8	20 20·3	53·8	21 27·1	22 0·2	22 33·1	23 5·8
57	48·7	19 24·1	59·5	20 34·7	21 9·7	21 44·7	22 19·4	54·0	23 28·4	24 2·7
58	19 34·8	20 11·8	20 48·7	21 25·5	22 2·2	22 38·7	23 15·0	23 51·2	24 27·3	25 3·1
59	20 23·8	21 2·5	21 41·1	22 19·6	57·9	23 36·2	24 14·3	24 52·2	25 30·0	26 7·6
60	21 16·0	56·5	22 36·9	23 17·3	23 57·5	24 37·6	25 17·6	25 57·4	26 37·1	27 16·6
61	22 11·8	22 54·3	23 36·7	24 19·0	25 1·2	25 43·4	26 25·4	27 7·3	27 49·1	28 30·7
62	23 11·6	23 56·2	24 40·8	25 25·3	26 9·8	26 54·1	27 38·4	28 22·6	29 6·7	29 50·6
63	24 16·0	25 3·0	25 49·9	26 36·8	27 23·7	28 10·5	28 57·3	29 44·0	30 30·6	31 17·1
64	25 25·5	26 15·1	27 4·7	27 54·2	28 43·8	29 33·3	30 22·9	31 12·4	32 1·8	32 51·3
65	26 41.0	27 33·5	28 25·9	29 18·4	30 11·0	31 3·6	31 56·2	32 48·9	33 41·6	34 34·3
66	28 3·3	28 58·9	29 54·7	30 50·5	31 46·4	32 42·5	33 38·6	34 34·9	35 31·3	36 27·8
66° 33′	51·9	29 49·4	30 47·1	31 45·0	32 42·9	33 41·1	34 39·4	35 37·9	36 36·5	37 35·3

Table III—Ascensional Difference of every Ecliptic Degree at every Degree of Terrestrial Latitude—(Contd.)

Lat.	41, 139 221, 319	42, 138 222, 318	43, 137 223, 317	44, 136 224, 316	45, 135 225, 315	46, 134 226, 314	47, 133 227, 313	48, 132 228, 312	49, 131 229, 311	50, 130 230, 310
0°	0° 0'0	0° 0'0	0° 0'0	0° 0'0	0° 0'0	0° 0'0	0° 0'0	0° 0'0	0° 0'0	0° 0'0
1	16'2	16'6	16'9	17'3	17'6	17'9	18'3	18'6	18'9	19'2
2	32'5	33'2	33'9	34'5	35'2	35'9	36'5	37'2	37'8	38'4
3	48'7	49'8	50'8	51'8	52'8	53'8	54'8	55'8	56'7	57'7
4	1 5'0	1 6'4	1 7'8	1 9'2	1 10'5	1 11'8	1 13'1	1 14'4	1 15'7	1 17'0
5	21'4	23'1	24'8	26'5	28'2	29'9	31'5	33'1	34'7	36'3
6	37'7	39'8	41'9	43'9	46'0	1 48'0	49'9	51'9	53'8	55'7
7	54'2	56'6	59'0	2 1'4	2 3'8	2 6'1	2 8'4	2 10'7	2 12'9	2 15'1
8	2 10'7	2 13'5	2 16'3	19'0	21'7	24'4	27'0	29'6	32'2	34'7
9	27'3	30'5	33'6	36'7	39'7	42'7	45'7	48'6	51'5	54'4
10	44'0	47'5	51'0	54'4	57'8	3 1'2	3 4'5	3 7'8	3 11'0	3 14'1
11	3 0'8	3 4'7	3 8'5	3 12'3	3 16'1	19'8	23'4	27'0	30'5	34'0
12	17'7	22'0	26'2	30'3	34'4	38'5	42'4	46'4	50'3	54'1
13	34'8	39'4	44'0	48'5	52'9	57'3	4 1'6	4 5'9	4 10 1	4 14'3
14	52'0	57'0	4 1'9	4 6'8	4 11'6	4 16'3	21'0	25'6	30'2	34'6
15	4 9'3	4 14'7	20'0	25'2	30'4	35'5	40'5	45'5	50'4	55'2
16	26'9	32'6	38'3	43'9	49'4	54'9	5 0'3	5 5'6	5 10'8	5 16'0
17	44'6	50'7	56'7	5 2'7	5 8'6	5 14'4	20'2	25'9	31'5	37'0
18	5 2'5	5 9'0	5 15'4	21'8	28'0	34'3	40'4	46'4	52'3	58'2
19	20'6	27'5	34'3	41'1	47'7	54'3	6 0'8	6 7'2	6 13'5	6 19'7
20	39'0	46'2	53'5	6 0'6	6 7'6	6 14'6	21'4	28'2	34'8	41'4
21	57'5	6 5'2	6 12'8	20'4	27'8	35'1	42'4	49'5	56'5	7 3'5
22	6 16'4	24'5	32'5	40'4	48'3	56'0	7 3'6	7 11'1	7 18'5	25'8
23	35'5	44'0	52'5	7 0'8	7 9'0	7 17'1	25'2	33'1	40'9	48'5
24	55'0	7 3'9	7 12'7	21'5	30'1	38'6	47'1	55'4	8 3'5	8 11'6
25	7 14'7	24'1	33'3	42'5	51'6	8 0'5	8 9'3	8 18'0	26'6	35'0
26	34'8	44'6	54'3	8 3'9	8 13'4	22'7	32'0	41'1	50'0	58'9
27	55'3	8 5'5	8 15'6	25'7	35'6	45'4	55'0	9 4'5	9 13'9	9 23'2
28	8 16'1	26'8	37'4	47'9	58'2	9 8'4	9 18'5	28'5	38'3	47'9
29	37'3	48'5	59'6	9 10'5	9 21'3	31'9	42'5	52'9	10 3'1	10 13'2
30	59'0	9 10'7	9 22'2	33'6	44'8	56'0	10 6'9	10 17'8	28'4	39'0
31	9 21'1	33'3	45'3	57'2	10 8'9	10 20'5	31'9	43'2	54'3	11 5'3
32	43'8	56'4	10 8'9	10 21'3	33'5	45'6	57'5	11 9'2	11 20'8	32'3
33	10 6'9	10 20'1	33'1	46'0	58'7	11 11'2	11 23'6	35'9	47'9	59'8

Table III—Ascensional Difference of every Ecliptic Degree at every Degree of Terrestrial Latitude—(Contd.)

Lat.	41, 139 221, 319	42, 138 222, 318	43, 137 223, 317	44, 136 224, 316	45, 135 225, 315	46, 134 226, 314	47, 133 227, 313	48, 132 228, 312	49, 131 229, 311	50, 130 230, 310
34°	10° 30′·7	10° 44′·3	10° 57′·9	11° 11′·3	11° 24′·5	11° 37′·6	11° 50′·4	12° 3′·2	12° 15′·7	12° 28′·6
35	55·0	11 9·2	11 23·3	37·2	50·9	12 4·5	12 17·9	31·2	44·2	57·1
36	11 19·9	34·7	49·3	12 3·8	12 18·1	32·2	46·1	59·9	13 13·5	13 26·8
37	45·6	12 0·9	12 16·1	31·1	46·0	13 0·6	13 15·1	13 29·4	43·5	57·4
38	12 11·9	27·9	43·6	59·2	13 14·7	29·9	45·0	59·8	14 14·5	14 28·9
39	39·1	55·6	13 12·0	13 28·2	44·2	14 0·0	14 15·7	14 31·1	46·3	15 1·3
40	13 7·0	13 24·2	41·2	58·0	14 14·7	31·1	47·3	15 3·4	15 19·2	34·8
41	35·9	53·7	14 11·4	14 28·8	46·1	15 3·2	15 20·0	36·7	53·1	16 9·3
42	14 5·7	14 24·2	42·5	15 0·6	15 18·6	36·3	53·8	16 11·1	16 28·2	45·0
43	36·5	55·7	15 14·7	33·6	52·2	16 10·6	16 28·8	46·8	17 4·5	17 22·0
44	15 8·4	15 28·3	48·1	16 7·7	16 27·0	46·1	17 5·0	17 23·7	42·1	18 0·3
45	41·5	16 2·2	16 22·7	43·0	17 3·1	17 23·0	42·6	18 2·0	18 21·2	40·1
46	16 15·9	37·4	58·7	17 19·8	40·7	18 1·3	18 21·7	41·9	19 1·8	19 21·4
47	51·6	17 14·0	17 36·1	58·0	18 19·7	41·2	19 2·4	19 23·4	44·1	20 4·5
48	17 28·8	52·0	18 15·0	18 37·8	19 0·4	19 22·7	44·8	20 6·6	20 28·1	49·4
49	18 7·6	18 31·8	55·7	19 19·4	42·9	20 6·1	20 29·1	51·8	21 14·2	21 36·3
50	48·2	19 13·3	19 38·2	20 2·8	20 27·3	51·5	21 15·4	21 39·0	22 2·4	22 25·4
51	19 30·7	56·8	20 22·7	48·4	21 13·8	21 39·0	22 3·9	22 28·6	52·9	23 17·0
52	20 15·2	20 42·4	21 9·4	21 36·2	22 2·7	22 28·9	54·9	23 20·6	23 46·0	24 11·1
53	21 2·0	21 30·4	58·5	22 26·4	54·1	23 21·5	23 48·6	24 15·4	24 41·9	25 8·1
54	51·3	22 20·9	22 50·2	23 19·4	23 48·3	24 16·9	24 45·2	25 13·2	25 41·0	26 8·4
55	22 43·3	23 14·2	23 44·9	24 15·3	24 45·5	25 15·4	25 45·0	26 14·4	26 43·4	27 12·1
56	23 38·3	24 10·6	24 42·7	25 14·6	25 46·2	26 17·5	26 48·5	27 19·2	27 49·7	28 19·8
57	24 36·7	25 10·5	25 44·1	26 17·5	26 50·6	27 23·4	27 56·0	28 28·3	29 0·2	29 31·8
58	25 38·8	26 14·3	26 49·5	27 24·5	27 59·3	28 33·8	29 8·0	29 41·9	30 15·5	30 48·8
59	26 45·1	27 22·3	27 59·3	28 36·1	29 12·7	29 49·0	30 25·0	31 0·8	31 36·2	32 11·3
60	27 56·0	28 35·2	29 14·2	29 52·9	30 31·5	31 9·8	31 47·8	32 25·6	33 3·0	33 40·2
61	29 12·2	29 53·6	30 34·7	31 15·6	31 56·4	32 36·9	33 17·1	33 57·1	34 36·8	35 16·3
62	30 34·5	31 18·2	32 1·7	32 45·0	33 28·2	34 11·2	34 54·0	35 36·5	36 18·7	37 0·7
63	32 3·6	32 49·9	33 36·1	34 22·2	35 8·2	35 53·9	36 39·5	37 24·9	38 10·1	38 55·0
64	33 40·7	34 30·0	35 19·2	36 8·4	36 57·5	37 46·5	38 35·3	39 24·0	40 12·6	41 0·9
65	35 27·0	36 19·8	37 12·5	38 5·2	38 58·0	39 50·6	40 43·3	41 35·9	42 28·4	43 20·8
66	37 24·4	38 21·1	39 17·8	40 14·7	41 11·7	42 8·8	43 6·0	44 3·2	45 0·5	45 57·9
66°·33′	38 34·3	39 33·5	40 32·8	41 32·3	42 32·0	43 31·9	44 31·9	45 32·2	46 32·6	47 33·2

Table III—Ascensional Difference of every Ecliptic Degree at every Degree of Terrestrial Latitude—(Contd.)

Lat.	51, 129 231, 309	52, 128 232, 308	53, 127 233, 307	54, 126 234, 306	55, 125 235, 305	56, 124 236, 304	57, 123 237, 303	58, 122 238, 302	59, 121 239, 301	60, 120 240, 300
0	0° 0′·0	0° 0′·0	0° 0′·0	0° 0′·0	0° 0′·0	0° 0′·0	0° 0′·0	0° 0′·0	0° 0′·0	0° 0′·0
1	19·5	19·8	20·1	20·4	20·7	21·0	21·2	21·5	21·8	22·0
2	39·0	39·6	40·2	40·8	41·4	42·0	42·5	43·0	43·6	44·1
3	58·6	59·5	1 0·4	1 1·3	2·1	1 3·0	1 3·8	1 4·6	1 5·4	1 6·1
4	1 18·2	1 19·4	20 6	21·8	22·9	24·0	25·1	26·2	27·2	28·3
5	37·8	39·3	40·8	42·3	43·7	45·1	46·5	47·8	49·2	50·4
6	57·5	59·3	2 1·1	2 2·9	2 4·6	2 6·3	2 8·0	2 9·6	2 11·1	2 12·7
7	2 17·3	2 19·4	21·5	23·6	25·6	27·6	29·5	31·4	33·2	35·0
8	37·2	39·6	2 42·0	44·4	46·7	48·9	51·1	53·3	55·4	57·5
9	57·1	59·9	3 2·6	3 5·2	3 7·8	3 10·4	3 12·9	3 15·3	3 17·7	3 20·0
10	3 17·2	3 20·3	23·3	26·3	29·1	32·0	34·8	37·5	40·1	42·7
11	37·5	40·8	44·1	47·4	50·6	53·7	56·8	59·8	4 2·7	4 5·5
12	57·8	4 1·5	4 5·1	4 8·7	4 12·2	4 15·6	4 19·0	4 22·2	25·4	28·5
13	4 18·4	22·4	26·3	30·2	34·0	37·7	41·3	44·9	48·3	51·7
14	39·1	43·4	47·6	51·8	55·9	59·9	5 3·9	5 7·7	5 11·5	5 15·1
15	59·9	5 4·6	5 9·2	5 13·7	5 18·1	5 22·4	26·6	30·8	34·8	38·7
16	5 21·0	26·0	30·9	35·7	40·5	45·1	49·6	54·0	58·4	6 2·6
17	42·4	47·7	52·9	58·1	6 3·1	6 8·0	6 12·8	6 17·6	6 22·2	26·7
18	6 3·9	6 9·6	6 15·2	6 20·6	26·0	31·2	36·3	41·4	46·3	51·1
19	25·8	31·8	37·6	43·4	49·1	54·7	7 0·1	7 5·5	7 10·7	7 15·7
20	47·9	54·2	7 0·5	7 6·6	7 12·6	7 18·4	24·2	29·9	35·4	40·7
21	7 10·3	7 17·0	23·6	30·0	36·4	42·6	48·7	54·6	8 0·4	8 6·1
22	33·0	40·1	47·0	53·8	8 0·5	8 7·0	8 13·4	8 19·7	25·8	31·8
23	56·1	8 3·5	8 10·8	8 18·0	25·0	31·9	38·6	45·2	51·6	57·9
24	8 19·5	27·3	35·0	42·5	49·9	57·1	9 4·2	9 11·1	9 17·9	9 24·4
25	43·3	51·5	59·5	9 7·4	9 15·2	9 22·7	30·2	37·4	44·5	51·4
26	9 7·6	9 16·1	9 24·6	32·8	40·9	48·9	56·6	10 4·2	10 11·7	10 18·9
27	32·3	41·2	50·0	58·7	10 7·1	10 15·4	10 23·6	31·5	39·3	46·9
28	57·4	10 6·8	10 16·0	10 25·0	33·9	42·5	51·0	59·4	11 7·5	11 15·4
29	10 23·1	32·9	42·5	51·9	11 1·1	11 10·2	11 19·1	11 27·8	36·2	44·5
30	49·3	59·5	11 9·5	11 19·3	29·0	38·4	47·7	56·8	12 5·6	12 14·2
31	11 16·1	11 26·7	37·1	47·4	57·4	12 7·3	12 17·0	12 26·4	35·6	44·6
32	43·5	54·5	12 5·4	12 16·1	12 26·6	36·8	46·9	56·7	13 6·3	13 15·7
33	12 11·5	12 23·0	34·4	12 45·5	56·4	13 7·1	13 17·5	13 27·8	37·8	47·6

Table III—Ascensional Difference of every Ecliptic Degree at every Degree of Terrestrial Latitude—(Contd.)

Lat.	51, 129 231, 309	52, 128 232, 308	53, 127 233, 307	54, 126 234, 306	55, 125 235, 305	56, 124 236, 304	57, 123 237, 303	58, 122 238, 302	59, 121 239, 301	60, 120 240, 300
34°	12° 40′3	12° 52′2	13° 4′0	13° 15′6	13° 26′9	13° 38′1	13° 49′0	13° 59′6	14° 10′1	14° 20′2
35	13 9·7	13 22·2	34·5	46·5	58·3	14 9·9	14 21·2	14 32·3	43·2	53·8
36	40·0	53·0	14 5·7	14 18·2	14 30·5	42·6	54·3	15 5·9	15 17·2	15 28·2
37	14 11·1	14 24·6	37·8	50·9	15 3·6	15 16·1	15 28·4	40·4	52·2	16 3·6
38	43·1	57·1	15 10·9	15 24·4	37·7	50·7	16 3·5	16 16·0	16 28·2	40·1
39	15 16·1	15 30·7	45·0	59·0	16 12·8	16 26·4	39·6	52·6	17 5·3	17 17·7
40	50·1	16 5·3	16 20·1	16 34·7	49·1	17 3·2	17 16·9	17 30·4	43·6	56·5
41	16 25·3	41·0	56·4	17 11·6	17 26·5	41·2	55·5	18 9·5	18 23·2	18 36·6
42	17 1·6	17 17·9	17 34·0	49·8	18 5·3	18 20·5	18 35·4	50·0	19 4·2	19 18·2
43	39·2	56·2	18 12·9	18 29·3	45·4	19 1·2	19 16·7	19 31·9	46·7	20 1·2
44	18 18·2	18 35·8	53·2	19 10·2	19 27·0	43·4	59·6	20 15·3	20 30·8	45·9
45	58·7	19 17·0	19 35·1	52·8	20 10·2	20 27·3	20 44·1	21 0·5	21 16·6	21 32·3
46	19 40·8	59·9	20 18·6	20 37·1	55·2	21 13·0	21 30·5	47·6	22 4·3	22 20·6
47	20 24·6	20 44·5	21 4·0	21 23·2	21 42·1	22 0·6	22 18·8	22 36·6	54·0	23 11·1
48	21 10·4	21 31·0	51·4	22 11·4	22 31·0	50·3	23 9·3	23 27·8	23 46·0	24 3·8
49	58·2	22 19·7	22 40·9	23 1·7	23 22·2	23 42·3	24 2·1	24 21·4	24 40·4	58·9
50	22 48·2	23 10·6	23 32·7	54·4	24 15·8	24 36·8	57·4	25 17·6	25 37·4	25 56·8
51	23 40·7	24 4·1	24 27·1	24 49·8	25 12·1	25 34·0	25 55·6	26 16·7	26 37·3	26 57·6
52	24 35·9	25 0·3	25 24·4	25 48·1	26 11·4	26 34·3	26 56·8	27 18·9	27 40·5	28 1·7
53	25 34·0	59·5	26 24·7	26 49·5	27 13·9	27 37·9	28 1·4	28 24·5	28 47·2	29 9·4
54	26 35·4	27 2·1	27 28·5	27 54·4	28 20·0	28 45·1	29 9·8	29 34·1	29 57·8	30 21·1
55	27 40·5	28 8·5	28 36·1	29 3·3	29 30·1	29 56·5	30 22·4	30 47·9	31 12·8	31 37·3
56	28 49·5	29 18·9	29 47·9	30 16·5	30 44·7	31 12·4	31 39·7	32 6·5	32 32·8	32 58·5
57	30 3·1	30 34·0	31 4·5	31 34·6	32 4·3	32 33·5	33 2·2	33 30·5	33 58·3	34 25·5
58	31 21·7	31 54·3	32 26·4	32 58·2	33 29·5	34 0·4	34 30·8	35 0·7	35 30·1	35 58·9
59	32 46·1	33 20·5	33 54·5	34 28·1	35 1·2	35 33·9	36 6·2	36 37·9	37 9·1	37 39·7
60	34 17·0	34 53·4	35 29·5	36 5·1	36 40·3	37 15·1	37 49·4	38 23·2	38 56·4	39 29·1
61	35 55·3	36 34·1	37 12·5	37 50·5	38 28·0	39 5·1	39 41·8	40 17·9	40 53·5	41 28·6
62	37 42·4	38 23·8	39 4·8	39 45·5	40 25·7	41 5·6	41 44·9	42 23·8	43 2·2	43 40·0
63	39 39·7	40 24·1	41 8·2	41 52·0	42 35·4	43 18·4	44 1·0	44 43·1	45 24·7	46 5·9
64	41 49·1	42 37·1	43 24·8	44 12·2	44 59·4	45 46·2	46 32·7	47 18·7	48 4·4	48 49·6
65	44 13·2	45 5·4	45 57·5	46 49·4	47 41·1	48 32·6	49 23·9	50 14·9	51 5·7	51 56·0
66	46 55·3	47 52·8	48 50·3	49 47·9	50 45·4	51 43·0	52 40·5	53 38·0	54 35·4	55 32·7
66°33′	48 33·9	49 34·9	50 36·0	51 37·3	52 38·8	53 40·5	54 42·4	55 44·4	56 46·6	57 49·0

Table III—Ascensional Difference of every Ecliptic Degree at every Degree of Terrestrial Latitude—(Contd.)

Lat.	61, 119	62, 118	63, 117	64, 116	65. 115	66, 114	67, 113	68, 112	69, 111	70, 110
	241, 299	242, 298	243, 297	244, 296	245, 295	246, 294	247, 293	248, 292	249, 291	250, 290
0°	0° 0′·0	0° 0′·0	0° 0′·0	0° 0′·0	0° 0′·0	0° 0′·0	0° 0′·0	0° 0′·0	0° 0′·0	0° 0′·0
1	22·3	22·5	22·8	23·0	23·2	23·4	23·6	23·8	24·0	24·2
2	44·6	45·1	45·5	46·0	46·4	46·8	47·3	47·7	48·0	48·4
3	1 6·9	1 7·6	1 8·3	1 9·0	1 9·7	1 10·3	1 10·9	1 11·5	1 12·1	1 12·6
4	29·3	30·2	31·2	32·1	33 0	33·8	34·6	35·4	36·2	36·9
5	51·7	52·9	51·1	55·2	56·3	57·4	58·4	59·4	2 0·4	2 1·3
6	2 14·2	2 15·6	2 17·1	2 18·4	2 19·8	2 21·0	2 22·3	2 23·5	24·6	25·7
7	36·8	38·5	40 1	41·7	43·3	44·8	46·2	47·6	49·0	50·3
8	59·5	3 1·4	3 3·3	3 5·1	3 6·9	3 8·6	3 10·3	3 11·9	3 13·4	3 14·9
9	3 22·3	24·5	26·6	28·7	30·7	32·6	34·5	36·3	38·0	39·7
10	45·2	47·7	50·0	52·3	54·6	56·7	58·8	4 0·8	4 2·8	4 4·6
11	4 8·3	4 11·0	4 13·6	4 16·2	4 18·6	4 21·0	4 23·3	25·5	27·7	29·7
12	31·6	34·5	37·4	40·2	42·9	45·5	48·0	50·4	52·8	55·0
13	55·0	58·2	5 1·4	5 4·4	5 7·3	5 10·1	5 12·9	5 15·5	5 18·0	5 20·5
14	5 18·7	5 22·1	25·5	28·8	32·0	35·0	38·0	40·8	43·6	46·2
15	42·6	46·3	49·9	53·4	56·8	6 0·1	6 3·3	6 6·4	6 9·3	6 12·1
16	6 6·7	6 10·7	6 14·6	6 18·3	6 22·0	25·5	28·9	32·2	35·3	38·4
17	31·1	35·3	39·5	43·5	47·4	51·1	54·8	58·3	7 1.6	7 4·9
18	55·7	7 0·3	7 4·7	7 8·9	7 13·1	7 17·1	7 20·9	7 24·7	28·2	31·7
19	7 20·7	25·5	30·2	34·7	39·1	43·3	47·4	51·4	55·2	58·8
20	46·0	51·1	56·0	8 0·8	8 5·5	8 9·9	8 14·3	8 18·5	8 22·5	8 26·3
21	8 11·6	8 17·0	8 22·2	27·3	32·2	36 9	41·5	45·9	50·2	54·2
22	37·6	43·3	48·8	54·1	59·3	9 4·3	9 9·1	9 13·8	9 18·2	9 22·5
23	9 4·0	9 10·0	9 15·8	9 21·4	9 26·8	32·1	37·2	42·1	46·8	51·3
24	30·9	37·1	43·2	49·1	54 8	10 0·4	10 5·7	10 10·8	10 15·8	10 20·5
25	58·2	10 4·7	10 11·1	10 17·3	10 23·3	29·1	34·7	40·1	45·3	50·2
26	10 26·0	32·8	39·5	46·0	52·3	58·3	11 4·2	11 9·9	11 15·3	11 20·5
27	54·3	11 1·5	11 8·4	11 15·2	11 21·8	11 28·1	34·3	40·2	45·9	51·3
28	11 23·1	30·6	37·9	45·0	51·9	58·5	12 5·0	12 11·1	12 17·1	12 22·8
29	52·6	12 0·4	12 8·0	12 15·5	12 22·6	12 29·6	36·3	42·7	48·9	54·9
30	12 22·6	30·8	38·8	46·5	54·0	13 1·3	13 8·3	13 15·0	13 21·5	13 27·7
31	53·4	13 1·9	13 10·2	13 18·3	13 26·1	33·7	41·0	48·0	54·7	14 1·2
32	13 24·9	33·8	42·4	50·8	59·0	14 6·8	14 14·4	14 21·8	14 28·8	35·6
33	57·1	14 6·4	14 15·4	14 15·4	14 32·6	40·8	48·8	56·4	15 3·7	15 10·8

Table III—Ascensional Difference of every Ecliptic Degree at every Degree of Terrestrial Latitude—(Contd.)

Lat.	61, 119 241, 299	62, 118 242, 298	63, 117 243, 297	64, 116 244, 296	65, 115 245, 295	66, 114 246, 294	67, 113 247, 293	68, 112 248 292	69, 111 249, 291	70, 110 250, 290
34°	14° 30′·2	14° 39′·8	14° 49′·2	14° 58′·3	15° 7′·1	15° 15′·7	15° 23′·9	15° 31′·9	15° 39′·5	15° 46′·9
35	15 4·1	15 14·1	15 23·9	15 33·4	42·6	51·5	16 0·1	16 8·3	16 16·2	16 23·9
36	38·9	49·4	59 6	16 9·5	16 19·0	16 28·3	37·2	45·8	54·1	17 2·1
37	16 14·8	16 25·7	16 36·2	46·5	56·5	17 6·1	17 15·4	17 24·4	17 33·0	41·3
38	51·7	17 3·0	17 14·0	17 24·7	17 35·1	45·1	54·8	18 4·1	18 13·1	18 21·7
39	17 29·8	41·6	53·0	18 4·1	18 14·9	18 25·3	18 35·4	45·1	54·5	19 3·4
40	18 9·1	18 21·3	18 33·2	44·8	56·0	19 6·9	19 17·3	19 27·5	19 37·2	46·5
41	49·7	19 2·4	19 14·8	19 26·9	19 38·5	49·8	20 0·7	20 11·2	20 21·4	20 31·1
42	19 31·8	45·0	57·9	20 10·4	20 22·6	20 34·3	45·7	56·6	21 7·1	21 17·2
43	20 15·3	20 29·1	20 42·5	55·6	21 8·2	21 20·4	21 32·3	21 43·6	54·6	22 5·1
44	21 0·6	21 14·9	21 28·9	21 42·5	55·6	22 8·3	22 20·7	22 32·5	22 43·9	54 9
45	47·6	22 2·6	22 17·1	22 31·2	22 44·9	58 2	23 11·0	23 23·4	23 35·3	23 46·7
46	22 36·6	52·2	23 7·3	23 22·0	23 36·3	23 50·1	24 3·5	24 16·4	24 28·8	24 40·7
47	23 27·7	23 43·9	59·7	24 15·0	24 29·9	24 44·3	58·3	25 11·7	25 24·7	25 37·1
48	24 21·1	24 38·0	24 54·5	25 10·5	25 26·0	25 41·1	25 55·6	26 9·7	26 23·2	26 36·2
49	25 17·0	25 34·6	25 51·8	26 8·5	26 24·8	26 40·5	26 55·7	27 10·4	27 24·5	27 38·1
50	26 15·7	26 34·1	26 52·0	27 9·5	27 26·5	27 42·9	27 58·8	28 14·2	28 28·9	28 43·2
51	27 17·3	27 36·6	27 55·4	28 13·7	28 31·4	28 48·6	29 5·3	29 21·4	29 36·8	29 51·7
52	28 22·3	28 42·5	29 2·2	29 21·4	29 39·9	29 58·0	30 15·4	30 32·3	30 48·5	31 4·2
53	29 31·0	29 52·2	30 12·8	30 32·9	30 52·5	31 11·4	31 29·7	31 47·4	32 4·5	32 20·9
54	30 43·9	31 6·1	31 27·8	31 48·9	32 9·4	32 29·3	32 48·6	33 7·2	33 25·2	33 42·5
55	32 1·2	32 24·6	32 47·4	33 9·7	33 31·3	33 52·3	34 12·6	34 32·3	34 51·2	35 9·5
56	33 23·8	33 48·4	34 12·5	34 36·0	34 58·8	35 21·0	35 42·5	36 3·3	36 23·3	36 42·6
57	34 52·1	35 18·2	35 43·7	36 8·5	36 32·7	36 56·2	37 19·0	37 41·0	38 2·3	38 22·8
58	36 27·1	36 54·8	37 21·8	37 48·2	38 13·8	38 38·8	39 3·1	39 26·6	39 49·2	40 11·1
59	38 9·8	38 39·2	39 8·0	39 36·1	40 3·5	40 30·1	40 56·0	41 21·1	41 45·4	42 8·8
60	40 1·2	40 32·7	41 3·5	41 33·6	42 2·9	42 31·6	42 59·4	43 26·4	43 52·5	44 17·8
61	42 3·0	42 36·8	43 10·0	43 42·4	44 14·1	44 45·0	45 15·1	45 44·4	46 12·7	46 40·1
62	44 17·2	44 53·8	45 29·7	46 5·0	46 39·4	47 13·1	47 45·9	48 17·9	48 48·9	49 18·9
63	46 46·4	47 26·4	48 5·7	48 44·3	49 22·2	49 59·2	50 35·5	51 10·8	51 45·2	52 18·6
64	49 34·3	50 18·4	51 1·9	51 44·8	52 27·1	53 8·5	53 49·2	54 28·9	55 7·8	55 45·6
65	52 46·0	53 35·6	54 24·7	55 13·3	56 1·4	56 48·8	57 35·5	58 21·4	59 6·5	59 50·7
66	56 30·0	57 27·1	58 24·0	59 20·7	60 17·2	61 13·4	62 9·3	63 4·8	63 59·8	64 54·3
66°·33′	58 51·5	59 54·3	60 57·1	62 0·2	63 3·4	64 6·7	65 10·2	66 13·9	67 17·7	68 21·6

Table III—Ascensional Difference of every Ecliptic Degree at every Degree of Terrestrial Latitude—(Contd).

Lat.	71, 109 251, 289	72, 108 252, 288	73, 107 253, 287	74, 106 254, 286	75, 105 255, 285	76, 104 256, 284	77, 103 257, 283	78, 102 258, 282	79, 101 259, 281	80, 100 260, 280
0°	0° 0'0	0° 0'0	0° 0'0	0° 0'0	0° 0'0	0° 0'0	-0° 0'0	0° 0'0	0° 0'0	0° 0'0
1	24 '4	24 '5	24 '7	24 '8	25 '0	25 '1	25 '2	25 '4	25 5	25 '6
2	48 '8	49 '1	49 '4	49 '7	50 '0	50 '3	50 '5	50 '7	50 '9	51 '1
3	1 13 '2	1 13 '7	1 14 '1	1 14 '6	1 15 '0	1 15 '4	1 15 '8	1 16 '1	1 16 '5	1 16 '8
4	37 '6	38 '3	38 '9	39 '5	40 '1	40 '6	41 '1	41 '6	42 '0	42 '4
5	2 2 '2	2 3 '0	2 3 '8	2 4 '6	2 5 '3	2 5 '9	2 6 '5	2 7 '1	2 7 '7	2 8 '1
6	26 '8	27 '8	28 '7	29 '6	30 '5	31 '3	32 '0	32 '7	33 '4	34 '0
7	51 '5	52 '7	53 '8	54 '8	55 '8	56 '8	57 '6	58 '5	59 '2	59 '9
8	3 16 '3	3 17 '7	3 18 '9	3 20 '1	3 21 '3	3 22 '4	3 23 '4	3 24 '3	3 25 '1	3 25 '9
9	41 '3	42 '8	44 '2	45 '6	46 '9	48 '1	49 '2	50 '3	51 '2	52 '1
10	4 6 '4	4 8 '1	4 9 '7	4 11 '2	4 12 '6	4 14 '0	4 15 '2	4 16 '4	4 17 '5	4 18 '5
11	31 '7	33 '5	35 '3	37 '0	38 '5	40 '0	41 '4	42 '7	43 '9	45 '0
12	57 '1	59 '2	5 1 '1	5 2 '9	5 4 '7	5 6 '3	5 7 '8	5 9 '2	5 10 '5	5 11 '7
13	5 22 '8	5 25 '0	27 '1	29 '1	31 '0	32 '7	34 '4	35 '9	37 '3	38 '6
14	48 '7	51 '1	53 '4	55 '5	57 '5	59 '4	6 1 '2	6 2 '9	6 4 '4	6 5 '8
15	6 14 '8	6 17 '4	6 19 '8	6 22 '2	6 24 '3	6 26 '4	28 '3	30 '1	31 '7	33 '2
16	41 '2	44 '0	46 '6	49 '1	51 '4	53 '7	55 '7	57 '6	59 '4	7 1 '0
17	7 7 '9	7 10 '9	7 13 '7	7 16 '3	7 18 '8	7 21 '2	7 23 '4	7 25 '4	7 27 '3	29 '0
18	35 '0	38 '1	41 '1	43 '9	46 '5	49 '0	51 '3	53 '5	55 '5	57 '3
19	8 2 '3	8 5 '6	8 8 '8	8 11 '8	8 14 '6	8 17 '2	8 19 '7	8 22 '0	8 24 '1	8 26 '1
20	30 '0	33 '5	36 '9	40 '0	43 '0	45 '8	48 '4	50 '9	53 '1	55 '2
21	58 '1	9 1 '8	9 5 '3	9 8 '7	9 11 '8	9 14 '8	9 17 '6	9 20 '1	9 22 '5	9 24 '7
22	9 26 '6	30 '5	34 '3	37 '8	41 '1	44 '2	47 '1	49 '8	52 '3	54 '6
23	55 '6	59 '7	10 3 '6	10 7 '3	10 10 '8	10 14 '1	10 17 '2	10 20 '0	10 22 '6	10 25 '0
24	10 25 '0	10 29 '3	33 '5	37 '3	41 '0	44 '5	47 '7	50 '7	53 '4	56 0
25	55 '0	59 '5	11 3 '8	11 7 '9	11 11 '7	11 15 '4	11 18 '7	11 21 '9	11 24 '8	11 27 '4
26	11 25 '5	11 30 '2	34 '7	39 '0	43 '0	46 '8	50 '4	53 '7	56 '7	59 '5
27	56 '5	12 1 '5	12 6 '6	12 10 '7	12 14 '9	12 18 '9	12 22 '6	12 26 '0	12 29 '2	12 32 '1
28	12 28 '2	33 '4	38 '4	43 '0	47 '5	51 '6	55 '5	59 '1	13 2 '4	13 5 5
29	13 0 '6	13 6 '0	13 11 '2	13 16 '0	13 20 '7	13 25 '0	13 29 '0	13 32 '8	36 '3	39 '5
30	33 '6	39 '3	44 '7	49 '8	54 '6	59 '1	14 3 '4	14 7 '3	14 10 '9	14 14 '2
31	14 7 '4	14 13 '3	14 19 '0	14 24 '3	14 29 '3	14 34 '0	38 '4	42 '5	46 '3	49 '8
32	42 '0	48 '2	54 '1	59 '6	15 4 '9	15 9 '8	15 14 '4	15 18 '7	15 22 '6	15 26 '2
33	15 17 '5	15 23 '9	15 30 '0	15 35 '8	41 '3	46 '4	51 '2	55 '7	59 '8	16 3 '6

Table III—Ascensional Difference of every Ecliptic Degree at every Degree of Terrestrial Latitude—(Contd.)

Lat.	71, 109	72, 108	73, 107	74, 106	75, 105	76, 104	77, 103	78, 102	79, 101	80, 100
	251, 289	252, 288	253, 287	254, 286	255, 285	256, 284	257, 283	258, 282	259, 281	260, 280
34°	15° 53′·9	16° 0′·6	16° 6′·9	16° 13′·0	16° 18′·7	16° 24′·0	16° 29′·0	16° 33′·7	16° 37′·9	16° 41′·9
35	16 31·2	38·2	44·8	51·1	57·1	17 2·6	17 7·8	17 12·7	17 17·1	17 21·2
36	17 9.7	17 16·9	17 23·8	17 30·4	17 36·5	42·3	47·8	52·8	57·5	18 1·7
37	49·2	56·8	18 3·9	18 10·7	18 17·2	18 23·2	18 28·9	18 34·1	18 39·0	43·4
38	18 29·9	18 37·8	45·3	52·4	59·1	19 5·4	19 11·2	19 16·7	19 21·7	19 26·4
39	19 12·0	19 20·2	19 28·0	19 35·3	19 42·3	48·8	55·0	20 0·7	20 5·9	20 10·7
40	55·4	20 3·9	20 12·0	20 19·7	20 27·0	20 33·8	20 40·2	46·1	51·6	56·6
41	20 40·4	49·2	57·7	21 5·7	21 13·2	21 20·3	21 26·9	21 33·1	21 38·8	21 44·0
42	21 26·9	21 36·1	21 44·9	53·3	22 1·1	22 8·5	22 15·4	22 21·9	22 27·8	22 33·2
43	22 15·2	22 24·8	22 34·0	22 42·7	50·8	58·6	23 5·8	23 12·5	23 18·6	23 24·3
44	23 5·4	23 15·4	23 25·0	23 34·0	23 42·5	23 50·6	58·1	24 5·1	24 11·5	24 17·4
45	57·7	24 8·1	24 18·0	24 27·5	24 36·4	24 44·7	24 52·6	59·9	25 6·6	25 12·8
46	24 52·1	25 3·0	25 13·4	25 23·2	25 32·5	25 41·3	25 49·4	25 57·0	26 4·1	26 10·5
47	25 49·0	26 0·4	26 11·2	26 21·5	26 31·2	26 40·3	26 48·9	26 56·8	27 4.1	27 10·9
48	26 48·6	27 0·5	27 11·8	27 22·5	27 32·7	27 42·2	27 51·1	27 59·4	28 7·1	28 14·1
49	27 51·1	28 3·5	28 15·3	28 26·6	28 37·2	28 47·1	28 56·5	29 5·2	29 13·2	29 20·6
50	28 56·8	29 9·8	29 22·2	29 33·9	29 45·0	29 55·5	30 5·3	30 14·4	30 22·8	30 30·5
51	30 6·0	30 19·6	30 32·6	30 44·9	30 56·6	31 7·5	31 17·8	31 27·4	31 36·2	31 44·3
52	31 19·1	31 33·4	31 47·1	32 0·0	32 12·3	32 23·8	32 34·6	32 44·6	32 53·9	33 2·4
53	32 36·6	32 51·7	33 6·0	33 19·7	33 32·5	33 44·7	33 56·0	34 6·6	34 16·4	34 25·4
54	33 59·1	34 14·9	34 30·0	34 44·4	34 58·0	35 10·8	35 22·8	35 33·9	35 44·3	35 53·7
55	35 27·0	35 43·7	35 59·7	36 14·9	36 29·3	36 42·8	36 55·8	37 7·3	37 18·2	37 28·3
56	37 1·2	37 18·9	37 35·9	37 51·9	38 7·2	38 21·5	38 35·0	38 47·6	38 59·2	39 9·8
57	38 42·5	39 1·3	39 19·4	39 36·5	39 52·7	40 8·0	40 22·4	40 35·7	40 48·1	40 59·5
58	40 32·1	40 52·3	41 11·5	41 29·8	41 47·1	42 3·5	42 18·9	42 33·2	42 46·4	42 58·6
59	42 31·4	42 53·0	43 13·6	43 33·3	43 51·9	44 9·5	44 26·1	44 41·5	44 55·8	45 9·0
60	44 42·1	45 5·4	45 27·7	45 49·0	46 9·2	46 28·2	46 46·2	47 2·9	47 18·5	47 32·7
61	47 6·5	47 31·9	47 56·2	48 19·4	48 41·5	49 2·4	49 22·0	49 40·3	49 57·4	50 13·1
62	49 48·0	50 15·9	50 42·7	51 8·3	51 32·7	51 55·8	52 17·6	52 38·0	52 56·9	53 14·4
63	52 50·9	53 22·1	53 52·1	54 20·8	54 48·3	55 14·3	55 38·9	56 2·0	56 23·5	56 43·4
64	56 22·3	56 57·9	57 32·3	58 5·4	58 37·0	59 7·2	59 35·8	60 2·7	60 27·9	60 51·3
65	60 33·9	61 16·0	61 56·9	62 36·4	63 14·6	63 51·2	64 26·2	64 59·4	65 30·6	65 59·7
66	65 48·2	66 41·4	67 33·8	68 25·2	69 15·6	70 4·8	70 52·6	71 38·8	72 23·2	73 5·4
66° 23′	69 25·7	70 29·8	71 34·1	72 38·6	73 43·1	74 47·7	75 52·5	76 57·3	78 2·2	79 7·2

Table III—Ascensional Difference of every Ecliptic Degree at every Degree of Terrestrial Latitude—(Contd.)

Lat.	81, 99	82, 98	83, 97	84, 96	85, 95	86, 94	87, 93	88, 92	89, 91	90
	261, 279	262 278	263, 277	264, 276	265, 275	266, 274	267, 273	268, 272	269, 271	270
0°	0° 0'0	0° 0'0	0° 0'0	0° 0'0	0° 0'0	0° 0'0	0° 0'0	0° 0'0	0° 0'0	0° 0'0
1	25'6	25'7	25'8	25'9	25'9	26'0	26'0	26'0	26'0	26'0
2	51'3	51'5	51'6	51'7	51'8	51'9	52'0	52'0	52'1	52'1
3	1 17'0	1 17'3	1 17'5	1 17'6	1 17'8	1 17'9	1 18'0	1 18'1	1 18'1	1 18'2
4	42'8	43'1	43'4	43'6	43'8	44'0	44'1	44'2	44'3	44'3
5	2 8'6	2 9'0	2 9'3	2 9'6	2 9'9	2 10'1	2 10'3	2 10'4	2 10'5	2 10'5
6	34'5	35'0	35'4	35'8	36'1	36'3	36'5	36'7	36'8	36'8
7	3 0'6	3 1'1	3 1'6	2'0	3 2'4	3 2'7	3 2'9	3 3'1	3 3'2	3 3'2
8	26'6	27'3	27'9	28'3	28'8	29'1	29'4	29'6	29'7	29'7
9	52'9	53'6	54'3	54'8	55'3	55'7	56'0	56'2	56'3	56'4
10	4 19'4	4 20'2	4 20'9	4 21'5	4 22'0	4 22'4	4 22'8	4 23'0	4 23'1	4 23'2
11	46'0	46'9	47'6	48'3	48'9	49'4	49'7	50'0	50'2	50'2
12	5 12'8	5 13'7	5 14'6	5 15'3	5 16'0	5 16'5	5 16'9	5 17'2	5 17'4	5 17'4
13	39'8	40'9	41'8	42'6	43'3	43'9	44'3	44'6	44'8	44'9
14	6 7'1	6 8'2	6 9'2	6 10'1	6 10'8	6 11'4	6 11'9	6 12'3	6 12'5	6 12.5
15	34'6	35'8	36'9	37'9	38'7	39'3	39'8	40'2	40'4	40'5
16	7 2'4	7 3'7	7 4'9	7 5'9	7 6'8	7 7'5	7 8'0	7 8'4	7 8'6	7 8'7
17	30'6	32'0	33'2	34'3	35'2	35'9	36'5	36'9	37'2	37'3
18	59'0	8 0'5	8 1'8	8 3'0	8 3'9	8 4'7	8 5'3	8 5'8	8 6'1	8 6'1
19	8 27'8	29'4	30'8	32'0	33'0	33'9	34'5	35'0	35'3	35'4
20	57'0	58'7	9 0'2	9 1'5	9 2'6	9 3'4	9 4'1	9 4'6	9 4'9	9 5'0
21	9 26'6	9 28'4	30'0	31'3	32'5	33'4	34'2	34'7	35'0	35'1
22	56'7	58'6	10 0'2	10 1'6	10 2'9	10 3'8	10 4'6	10 5'2	10 5'5	10 5'6
23	10 27'2	10 29'2	30'9	32'4	33'7	34'8	35'6	36.1	36'5	36'6
24	58'3	11 0'3	11 2'1	11 3'7	11 5'1	11 6'2	11 7'0	11 7'6	11 8'0	11 8'1
25	11 29'8	32'0	33'9	35'6	37'0	38'1	39'0	39'7	40'1	40'2
26	12 2'0	12 4'3	12 6'3	12 8'0	12 9'5	12 10'7	12 11'6	12 12'3	12 12'7	12 12'8
27	34'8	37'2	39'3	41'1	42'6	43'9	44'9	45'6	46'0	46'1
28	13 8'2	13 10'7	13 12'9	13 14'8	13 16'4	13 17'7	13 18'8	13 19'5	13 19'9	13 20'1
29	42'4	45'0	47'2	49'2	50'9	52'3	53'4	54'2	54'6	54'8
30	14 17'3	14 20'0	14 22'4	14 24'4	14 26'2	14 27'6	14 28'8	14 29'6	14 30'1	14 30'2
31	53'0	55'8	58'3	15 0'4	15 2'3	15 3'8	15 5'0	15 5'8	15 6'3	15 6'5
32	15 29'5	15 32'5	15 35'1	37'3	39'2	40'8	42'0	42'9	43'4	43'6
33	16 7'0	16 10'1	16 12'8	16 15'1	16 17'1	16 18'8	16 20'0	16 21'0	16 21'5	16 21'7

Table III—Ascensional Difference of every Ecliptic Degree at every Degree of Terrestrial Latitude—(Contd.)

Lat.	81, 99 261, 279	82, 98 262, 278	83, 97 263, 277	84, 96 264, 276	85, 95 265, 275	86, 94 266, 274	87, 93 267, 273	88, 92 268, 272	89, 91 269, 271	90 270
34°	16° 45′·4	16° 48′·6	16° 51′·5	16° 53′·9	16° 56′·0	16° 57′·7	16° 59′·1	17° 0′·0	17° 0′·6	17° 0′·8
35	17 25·0	17 28·3	17 31·2	17 33·0	17 36·0	17 37·7	17 36·1	40·1	40·7	40·9
36	18 5·6	18 9·1	18 12·1	18 14·8	18 17·1	18 18·9	18 20·4	18 21·4	18 22·0	18 22·2
37	47·4	51·0	54·2	57·0	59·4	19 1·3	19 2·8	19 3·9	19 4·5	19 4·7
38	19 30·6	19 34·3	19 37·7	19 40·6	19 43·0	45·0	46·6	47·7	48·4	48·6
39	20 15·1	20 19·0	20 22·5	20 25·5	20 28·1	20 30·1	20 31·8	20 32·9	20 33·6	20 33·
40	21 1·1	21 5·2	21 8·8	21 12·0	21 14·6	21 16·8	21 18·5	21 19·7	21 20·4	21 20·7
41	48·8	53·0	56·8	22 0·1	22 2·8	22 5·1	22 6·9	22 8·1	22 8·9	22 9·2
42	22 38·2	22 42·6	22 46·5	49·9	52·8	55·2	57·0	58·4	59·1	59·4
43	23 29·5	23 34·1	23 38·2	23 41·7	23 44·7	23 47·2	23 49·1	23 50·5	23 51·3	23 51·6
44	24 22·5	24 27·6	24 31·9	24 35·6	24 38·7	24 41·3	24 43·3	24 44·7	24 45·6	24 45·9
45	25 18·4	25 23·4	25 27·8	25 31·7	25 35·0	25 37·7	25 39·7	25 41·2	25 42·1	25 42·4
46	26 16·3	26 21·6	26 26·2	26 30·3	26 33·7	26 36·5	26 38·7	26 40·2	26 41·2	26 41·5
47	27 17·0	27 22·5	27 27·3	27 31·5	27 35·1	27 38·0	27 40·3	27 42·0	27 42·9	27 43·3
48	28 20·5	28 26·3	28 31·3	28 35·7	28 39·5	28 42·5	28 44·9	28 46·6	28 47·7	28 48·0
49	29 27·2	29 33·3	29 38·6	29 43·2	29 47·1	29 50·3	29 52·8	29 54·6	29 55·7	29 56·0
50	30 37·5	30 43·8	30 49·4	30 54·2	30 58·3	31 1·7	31 4·3	31 6·2	31 7·3	31 7·7
51	31 51·7	31 58·3	32 4·1	32 9·2	32 13·5	32 17·0	32 19·8	32 21·8	32 23·0	32 23·4
52	33 10·2	33 17·1	33 23·3	33 28·6	33 33·1	33 36·9	33 39·7	33 41·8	33 43·1	33 43·5
53	34 33·5	34 40·8	34 47·3	34 53·0	34 57·7	35 1·7	35 4·7	35 6·9	35 8·2	35 8·7
54	36 2·3	36 10·1	36 16·9	36 22·9	36 28·0	36 32·1	36 35·3	36 37·6	36 39·0	36 39·5
55	37 37·4	37 45·6	37 52·8	37 59·2	38 4·5	38 8·9	38 12·3	38 14·8	38 16·3	38 16·8
56	39 19·5	39 28·2	39 36·0	39 42·7	39 48·4	39 53·1	39 56·7	39 59·3	40 0·9	40 1·4
57	41 9·8	41 19·1	41 27·4	41 34·6	41 40·7	41 45·6	41 49·5	41 52·3	41 54·0	41 54·6
58	43 9·7	43 19·7	43 28·6	43 36·3	43 42·8	43 48·2	43 52·3	43 55·3	43 57·1	43 57·7
59	45 20·9	45 31·7	45 41·3	45 49·6	45 56·7	46 2·5	46 7·0	46 10·2	46 12·2	46 12·8
60	47 45·8	47 57·5	48 7·9	48 17·0	48 24·7	48 31·0	48 35·9	48 39·5	48 41·6	48 42·3
61	50 27·4	50 40·3	50 51·8	51 1·7	51 10·2	51 17·2	51 22·7	51 26·6	51 28·9	51 29·7
62	53 30·4	53 44·8	53 57·6	54 8·8	54 18·3	54 26·1	54 32·2	54 36·6	54 39·2	54 40·1
63	57 1·6	57 18·0	57 32·7	57 45·5	57 56·4	58 5·3	58 12·3	58 17·4	58 20·4	58 21·4
64	61 12·7	61 32·1	61 49·5	62 4·7	62 17·7	62 28·4	62 36·8	62 42·8	62 46·4	62 47·7
65	66 26·7	66 51·2	67 13·3	67 32·8	67 49·5	68 3·3	68 14·2	68 22·0	68 26·7	68 28·3
66	73 45·3	74 22·4	74 56·5	75 27·2	75 54·0	76 16·7	76 34·7	76 47·9	76 55·9	76 58·5
66°·33′	80 12·3	81 17·4	82 22·6	83 27·9	84 33·1	85 38·5	86 43·8	87 49·2	88 54·6	90 0·0

Table IV—The Apparent Time of Sunrise, when latitude and declination are of different names, or the Apparent Time of Sunset, when latitude and declination are of the same name.

Lat.	Declinations																									
	0		1		2		3		4		5		6		7		8		9		10		11		12	
	H.	M.	H.	M.	H.	M.	H.	M.	H.	M.	H.	M.	H.	M.	H.	M.	H.	M.	H.	M.	H.	M.	H.	M.	H.	M.
0°	6	0	6	0	6	0	6	0	6	0	6	0	6	0	6	0	6	0	6	0	6	0	6	0	6	0
1	6	0	6	0	4	6	6	8	6	13	6	17	6	21	6	25	6	29	6	34	6	38	6	42	6	47	6	51
2	6	0	6	0	8	6	6	17	6	25	6	34	6	42	6	50	6	59	6	7	6	16	6	25	6	33	6	42
3	6	0	6	0	13	6	6	25	6	38	6	50	6	1	6	16	6	28	6	41	6	54	6	2	7	6	2	20	6	2	33
4	6	0	6	0	17	6	6	34	6	50	6	1	7	6	1	24	6	1	41	6	1	58	6	2	15	6	2	32	6	2	50	6	3	7	6	3	24
5	6	0	6	0	21	6	6	42	6	1	3	6	1	24	6	1	45	6	2	6	6	2	28	6	2	49	6	3	10	6	3	32	6	3	54	6	4	16
6	6	0	6	0	25	6	6	50	6	1	16	6	1	41	6	2	6	6	2	32	6	2	57	6	3	23	6	3	49	6	4	15	6	4	41	6	5	7
7	6	0	6	0	29	6	6	59	6	1	28	6	1	58	6	2	28	6	2	57	6	3	27	6	3	57	6	4	27	6	4	58	6	5	28	6	5	59
8	6	0	6	0	34	6	1	7	6	1	41	6	2	15	6	2	49	6	3	23	6	3	57	6	4	32	6	5	6	6	5	41	6	6	16	6	6	51
9	6	0	6	0	38	6	1	16	6	1	54	6	2	32	6	3	11	6	3	49	6	4	27	6	5	6	6	5	45	6	6	24	6	7	3	6	7	43
10	6	0	6	0	42	6	1	25	6	2	7	6	2	50	6	3	32	6	4	15	6	4	58	6	5	41	6	6	24	6	7	8	6	7	51	6	8	36
11	6	0	6	0	47	6	1	38	6	2	20	6	3	7	6	3	54	6	4	41	6	5	28	6	6	16	6	7	3	6	7	51	6	8	40	6	9	28
12	6	0	6	0	51	6	1	42	6	2	33	6	3	24	6	4	16	6	5	7	6	5	59	6	6	51	6	7	43	6	8	36	6	9	28	6	10	21
13	6	0	6	0	55	6	1	51	6	2	46	6	3	42	6	4	38	6	5	34	6	6	30	6	7	26	6	8	23	6	9	20	6	10	17	6	11	15
14	6	0	6	1	0	6	2	0	6	3	0	6	4	0	6	5	0	6	6	0	6	7	1	6	8	2	6	9	3	6	10	5	6	11	7	6	12	9
15	6	0	6	1	4	6	2	9	6	3	13	6	4	18	6	5	22	6	6	27	6	7	32	6	8	38	6	9	44	6	10	50	6	11	57	6	13	4
16	6	0	6	1	9	6	2	18	6	3	27	6	4	36	6	5	45	6	6	54	6	8	4	6	9	14	6	10	25	6	11	36	6	12	47	6	13	59
17	6	0	6	1	13	6	2	27	6	3	40	6	4	54	6	6	8	6	7	22	6	8	36	6	9	51	6	11	6	6	12	22	6	13	38	6	14	54
18	6	0	6	1	18	6	2	36	6	3	54	6	5	12	6	6	31	6	7	50	6	9	9	6	10	28	6	11	48	6	13	8	6	14	29	6	15	50
19	6	0	6	1	23	6	2	45	6	4	8	6	5	31	6	6	54	6	8	18	6	9	42	6	11	6	6	12	30	6	13	55	6	15	21	6	16	47
20	6	0	6	1	27	6	2	55	6	4	22	6	5	50	3	7	18	6	8	46	6	10	15	6	11	44	6	13	13	6	14	43	6	16	14	6	17	45
21	6	0	6	1	32	6	3	4	6	4	37	6	6	9	6	7	42	6	9	15	6	10	48	6	12	22	6	13	57	6	15	31	6	17	7	6	18	43
22	6	0	6	1	37	6	3	14	6	4	51	6	6	29	6	8	6	6	9	44	6	11	22	6	13	1	6	14	40	6	16	20	6	18	1	6	19	42
23	6	0	6	1	42	6	3	24	6	5	6	6	6	48	6	8	31	6	10	14	6	11	57	6	13	41	6	15	25	6	17	10	6	18	56	6	20	42
24	6	0	6	1	47	6	3	34	6	5	21	6	7	8	6	8	56	6	10	44	6	12	32	6	14	21	6	16	11	6	18	1	6	19	52	6	21	43
25	6	0	6	1	52	6	3	44	6	5	36	6	7	28	6	9	21	6	11	14	6	13	8	6	15	2	6	16	57	6	18	52	6	20	48	6	22	45
26	6	0	6	1	57	6	3	54	6	5	52	6	7	49	6	9	47	6	11	45	6	13	44	6	15	43	6	17	43	6	19	44	6	21	46	6	23	48
27	6	0	6	2	2	6	4	5	6	6	7	6	8	10	6	10	13	6	12	17	6	14	21	6	16	26	6	18	31	6	20	37	6	22	44	6	24	52
28	6	0	6	2	8	6	4	15	6	6	23	6	8	31	6	10	40	6	12	49	6	14	58	6	17	9	6	19	19	6	21	31	6	23	44	6	25	57
29	6	0	6	2	13	6	4	26	6	6	40	6	8	53	6	11	7	6	13	22	6	15	37	6	17	52	6	20	9	6	22	26	6	24	44	6	27	4
30	6	0	6	2	19	6	4	37	6	6	56	6	9	15	6	11	35	6	13	55	6	16	16	6	18	37	6	20	59	6	23	22	6	25	46	6	28	12
31	6	0	6	2	24	6	4	49	6	7	13	6	9	38	6	12	3	6	14	29	6	16	55	6	19	23	6	21	51	6	24	20	6	26	50	6	29	21
32	6	0	6	2	30	6	5	0	6	7	30	6	10	1	6	12	32	6	15	4	6	17	36	6	20	9	6	22	43	6	25	18	6	27	54	6	30	34
33	6	0	6	2	36	6	5	12	6	7	48	6	10	25	6	13	2	6	15	39	6	18	18	6	20	57	6	23	37	6	26	18	6	29	0	6	31	44

N.B.—The Apparent Time of Sunset, when latitude and declination are of different names, or the Apparent Time of Sunrise, when latitude and declination are of the same name, is obtained by deducting the tabular figures from 12 hours.

Table IV—The Apparent Time of Sunrise, when latitude and declination are of different names, or the Apparent Time of Sunset, when latitude and declination are of the same name—(Contd.)

Lat.	Declinations												
	13	14	15	16	17	18	19	20	21	22	23	23·27	
	H.M.S.	H.M.S.	H.M.S.	H.M.S.	H.M.S.	H.M.S.	H.M.S.	H.M.S.	H.M.S.	H.M.S.	H.M.S.	H.M.S.	
0°	6 0 0	6 0 0	6 0 0	6 0 0	6 0 0	6 0 0	6 0 0	6 0 0	6 0 0	6 0 0	6 0 0	6 0 0	
1	6 0 55	6 1 0	6 1 4	6 1 9	6 1 13	6 1 18	6 1 23	6 1 27	6 1 32	6 1 37	6 1 42	6 1 44	
2	6 1 51	6 2 0	6 2 9	6 2 18	6 2 27	6 2 36	6 2 45	6 2 55	6 3 4	6 3 14	6 3 24	6 3 28	
3	6 2 46	6 3 0	6 3 13	6 3 27	6 3 40	6 3 54	6 4 8	6 4 22	6 4 37	6 4 51	6 5 6	6 5 13	
4	6 3 42	6 4 0	6 4 18	6 4 36	6 4 54	6 5 12	6 5 31	6 5 50	6 6 9	6 6 29	6 6 48	6 6 57	
5	6 4 38	6 5 0	6 5 22	6 5 45	6 6 8	6 6 31	6 6 54	6 7 18	6 7 42	6 8 6	6 8 31	6 8 42	
6	6 5 34	6 6 0	6 6 27	6 6 54	6 7 22	6 7 50	6 8 18	6 8 46	6 9 15	6 9 44	6 10 14	6 10 27	
7	6 6 30	6 7 1	6 7 32	6 8 4	6 8 36	6 9 9	6 9 42	6 10 15	6 10 48	6 11 22	6 11 57	6 12 13	
8	6 7 25	6 8 2	6 8 38	6 9 14	6 9 51	6 10 28	6 11 6	6 11 44	6 12 22	6 13 1	6 13 41	6 13 59	
9	6 8 23	6 9 3	6 9 44	6 10 25	6 11 6	6 11 48	6 12 30	6 13 13	6 13 57	6 14 41	6 15 25	6 15 45	
10	6 9 20	6 10 5	6 10 50	6 11 36	6 12 22	6 13 8	6 13 55	6 14 43	6 15 31	6 16 20	6 17 10	6 17 33	
11	6 10 17	6 11 7	6 11 56	6 12 47	6 13 38	6 14 29	6 15 21	6 16 14	6 17 7	6 18 1	6 18 56	6 19 21	
12	6 11 15	6 12 9	6 13 4	6 13 59	6 14 54	6 15 50	6 16 47	6 17 45	6 18 43	6 19 42	6 20 42	6 21 10	
13	6 12 13	6 13 12	6 14 11	6 15 11	6 16 11	6 17 12	6 18 14	6 19 17	6 20 20	6 21 25	6 22 30	6 23 0	
14	6 13 12	6 14 15	6 15 19	6 16 24	6 17 29	6 18 35	6 19 42	6 20 50	6 21 58	6 23 8	6 24 18	6 24 50	
15	6 14 11	6 15 19	6 16 28	6 17 38	6 18 48	6 19 59	6 21 11	6 22 33	6 23 37	6 24 52	6 26 7	6 26 42	
16	6 15 11	6 16 24	6 17 38	6 18 52	6 20 7	6 21 23	6 22 40	6 23 58	6 25 17	6 26 37	6 27 58	6 28 35	
17	6 16 11	6 17 29	6 18 48	6 20 7	6 21 27	6 22 48	6 24 10	6 25 33	6 26 58	6 28 23	6 29 50	6 30 29	
18	6 17 12	6 18 35	6 19 59	6 21 23	6 22 48	6 24 14	6 25 42	6 27 10	6 28 40	6 30 10	6 31 43	6 32 25	
19	6 18 14	6 19 42	6 21 11	6 22 40	6 24 10	6 25 42	6 27 14	6 28 48	6 30 23	6 31 59	6 33 37	6 34 22	
20	6 19 17	6 20 50	6 22 23	6 23 58	6 25 33	6 27 10	6 28 48	6 30 27	6 32 8	6 33 49	6 35 33	6 36 20	
21	6 20 20	6 21 59	6 23 37	6 25 17	6 26 58	6 28 40	6 30 23	6 32 8	6 33 54	6 35 41	6 37 31	6 38 20	
22	6 21 25	6 23 8	6 24 52	6 26 37	6 28 23	6 30 10	6 31 59	6 33 49	6 35 41	6 37 35	6 39 30	6 40 22	
23	6 22 30	6 24 18	6 26 8	6 27 58	6 29 50	6 31 43	6 33 37	6 35 33	6 37 31	6 39 30	6 41 31	6 42 26	
24	6 23 36	6 25 30	6 27 24	6 29 20	6 31 18	6 33 16	6 35 16	6 37 18	6 39 22	6 41 27	6 43 34	6 44 33	
25	6 24 43	6 26 42	6 28 43	6 30 44	6 32 47	6 34 52	6 36 57	6 39 5	6 41 15	6 43 26	6 45 40	6 46 41	
26	6 25 52	6 27 56	6 30 2	6 32 9	6 34 18	6 36 28	6 38 40	6 40 54	6 43 10	6 45 28	6 47 48	6 48 51	
27	6 27 1	6 29 12	6 31 23	6 33 36	6 35 51	6 38 7	6 40 25	6 42 45	6 45 7	6 47 31	6 49 58	6 51 5	
28	6 28 12	6 30 28	6 32 46	6 35 5	6 37 25	6 39 48	6 42 12	6 44 38	6 47 6	6 49 37	6 52 11	6 53 20	
29	6 29 25	6 31 47	6 34 10	6 36 35	6 39 2	6 41 30	6 44 1	6 46 33	6 49 8	6 51 46	6 54 26	6 55 30	
30	6 30 38	6 33 6	6 35 36	6 38 7	6 40 40	6 43 15	6 45 52	6 48 31	6 51 13	6 53 57	6 56 45	6 58 1	
31	6 31 54	6 34 28	6 37 4	6 39 41	6 42 21	6 45 2	6 47 46	6 50 32	6 53 20	6 56 12	6 58 6	7 0 26	
32	6 33 11	6 35 51	6 38 33	6 41 17	6 44 3	6 46 52	6 49 42	6 52 35	6 55 31	6 58 30	7 1 32	7 2 54	
33	6 34 29	6 37 16	6 40 5	6 42 56	6 45 48	6 48 44	6 51 41	6 44 41	6 57 44	7 0 51	7 4 0	7 5 27	

N.B.—The Apparent Time of Sunset, when latitude and declination are of different names, or the Apparent Time of Sunrise, when latitude and declination are of the same name, is obtained by deducting the tabular figures from 12 hours.

Table IV—The Apparent Time of Sunrise, when latitude and declination are of different names, or the Apparent Time of Sunset, when latitude and declination are of the same name—(Contd.)

Lat.	Declinations																									
	0		1		2		3		4		5		6		7		8		9		10		11		12	
	H.	M. S.	H.	M. S.	H.	M. S.	H.	M. S.	H.	M. S.	H.	M. S.	H.	M. S.	H.	M. S.	H.	M. S.	H.	M. S.	H.	M. S.	H.	M. S.	H.	M. S.
34°	6	0 0	6	2 42	6	5 24	6	8 6	6	10 49	6	13 32	6	16 16	6	19 0	6	21 45	6	24 32	6	27 19	6	30 8	6	32 58
35	6	0 0	6	2 48	6	5 36	6	8 25	6	11 14	6	14 3	6	16 53	6	19 44	6	22 35	6	25 28	6	28 22	6	31 17	6	34 14
36	6	0 0	6	2 54	6	5 49	6	8 44	6	11 39	6	14 35	6	17 31	6	20 28	6	23 27	6	26 26	6	29 26	6	32 29	6	35 32
37	6	0 0	6	3 1	6	6 2	6	9 3	6	12 5	6	15 7	6	18 10	6	21 14	6	24 19	6	27 25	6	30 33	6	33 41	6	36 52
38	6	0 0	6	3 8	6	6 15	6	9 23	6	12 32	6	15 41	6	18 50	6	22 1	6	25 13	6	28 26	6	31 40	6	34 56	6	38 14
39	6	0 0	6	3 14	6	6 29	6	9 44	6	12 59	6	16 15	6	19 32	6	22 50	6	26 8	6	29 29	6	32 50	6	36 14	6	39 39
40	6	0 0	6	3 21	6	6 43	6	10 5	6	13 27	6	16 50	6	20 14	6	23 39	6	27 6	6	30 33	6	34 2	6	37 33	6	41 6
41	6	0 0	6	3 29	6	6 57	6	10 27	6	13 56	6	17 27	6	20 58	6	24 30	6	28 4	6	31 39	6	35 16	6	38 55	6	42 35
42	6	0 0	6	3 36	6	7 12	6	10 49	6	14 26	6	18 4	6	21 43	6	25 23	6	29 5	6	32 48	6	36 32	6	40 19	6	44 8
43	6	0 0	6	3 44	6	7 28	6	11 12	6	14 57	6	18 43	6	22 30	6	26 18	6	30 7	6	33 58	6	37 51	6	41 46	6	45 44
44	6	0 0	6	3 52	6	7 44	6	11 36	6	15 29	6	19 23	6	23 18	6	27 14	6	31 12	6	35 12	6	39 13	6	43 17	6	47 23
45	6	0 0	6	4 0	6	8 0	6	12 1	6	16 2	6	20 5	6	24 8	6	28 13	6	32 19	6	36 27	6	40 37	6	44 50	6	49 5
46	6	0 0	6	4 9	6	8 17	6	12 27	6	16 37	6	20 48	6	25 0	6	29 13	6	33 28	6	37 46	6	42 5	6	46 27	6	50 52
47	6	0 0	6	4 18	6	8 35	6	12 53	6	17 12	6	21 32	6	25 53	6	30 16	6	34 40	6	39 7	6	43 36	6	48 8	6	52 42
48	6	0 0	6	4 27	6	8 53	6	13 21	6	17 49	6	22 18	6	26 49	6	31 21	6	35 55	6	40 31	6	45 10	6	49 52	6	54 37
49	6	0 0	6	4 36	6	9 13	6	13 50	6	18 27	6	23 6	6	27 47	6	32 29	6	37 13	6	42 0	6	46 49	6	51 41	6	56 37
50	6	0 0	6	4 46	6	9 32	6	14 19	6	19 7	6	23 56	6	28 47	6	33 39	6	38 34	6	43 31	6	48 31	6	53 35	6	58 42
51	6	0 0	6	4 56	6	9 53	6	14 51	6	19 49	6	24 49	6	29 50	6	34 53	6	39 59	6	45 7	6	50 18	6	55 33	7	0 52
52	6	0 0	6	5 7	6	10 15	6	15 23	6	20 32	6	25 43	6	30 56	6	36 10	6	41 27	6	46 47	6	52 10	6	57 37	7	3 9
53	6	0 0	6	5 19	6	10 37	6	15 57	6	21 18	6	26 40	6	32 4	6	37 31	6	43 0	6	48 32	6	54 8	6	59 48	7	5 32
54	6	0 0	6	5 30	6	11 1	6	16 33	6	22 6	6	27 40	6	33 16	6	38 55	6	44 37	6	50 22	6	56 11	7	2 4	7	8 3
55	6	0 0	6	5 43	6	11 26	6	17 10	6	22 56	6	28 43	6	34 32	6	40 24	6	46 19	6	52 18	6	58 20	7	4 28	7	10 41
56	6	0 0	6	5 56	6	11 52	6	17 50	6	23 48	6	29 49	6	35 51	6	41 57	6	48 6	6	54 19	7	0 37	7	7 0	7	13 28
57	6	0 0	6	6 10	6	12 20	6	18 31	6	24 44	6	30 58	6	37 15	6	43 36	6	50 0	6	56 28	7	3 1	7	9 40	7	16 25
58	6	0 0	6	6 24	6	12 49	6	19 15	6	25 42	6	32 12	6	38 44	6	45 20	6	51 59	6	58 44	7	5 34	7	12 30	7	19 33
59	6	0 0	6	6 40	6	13 20	6	20 1	6	26 44	6	33 29	6	40 18	6	47 10	6	54 6	7	1 8	7	8 16	7	15 30	7	22 52
60	6	0 0	6	6 56	6	13 52	6	20 50	6	27 50	6	34 52	6	41 57	6	49 7	6	56 21	7	3 41	7	11 8	7	18 42	7	26 25
61	6	0 0	6	7 13	6	14 27	6	21 42	6	28 59	6	36 19	6	43 43	6	51 11	6	58 45	7	6 19	7	14 12	7	22 7	7	30 12
62	6	0 0	6	7 32	6	15 4	6	22 38	6	30 17	6	37 53	6	45 36	6	53 24	7	1 18	7	9 15	7	17 28	7	25 46	7	34 7
63	6	0 0	6	7 51	6	15 43	6	23 37	6	31 33	6	39 33	6	47 37	6	55 47	7	4 3	7	12 26	7	20 59	7	29 42	7	38 19
64	6	0 0	6	8 12	6	16 25	6	24 40	6	32 58	6	41 20	6	49 47	6	58 11	7	6 59	7	15 48	7	24 46	7	33 57	7	43 21
65	6	0 0	6	8 35	6	17 11	6	25 49	6	34 30	6	43 15	6	52 6	7	1 4	7	10 10	7	19 25	7	28 52	7	38 33	7	48 28
66	6	0 0	6	8 59	6	18 0	6	27 2	6	36 9	6	45 20	6	54 37	7	4 2	7	13 36	7	23 21	7	33 19	7	43 33	7	54 4
66°33′	6	0 0	6	9 13	6	18 28	6	27 45	6	37 6	6	46 13	6	56 7	7	5 46	7	15 37	7	25 40	7	35 59	7	46 9	7	57 18

N.B.—The Apparent Time of Sunset, when latitude and declination are of different names, or the Apparent time of Sunrise, when latitude and declination are of the same name, is obtained by deducting the tabular figures from 12 hours.

Table IV—The Apparent Time of Sunrise, when latitude and declination are of different names, or the Apparent Time of Sunset, when latitude and declination are of the same name—(Contd.)

Lat.	Declinations											
	13	14	15	16	17	18	19	20	21	22	23	23°27
	H.M.S.	H.M.S.	H.M.S.	H.M.S.	H.M.S.	H.M.S.	H.M.S.	H.M.S.	H.M.S.	H.M.S.	H.M.S.	H.M.S.
34°	6 35 50	6 38 44	6 41 39	6 44 36	6 47 36	6 50 38	6 53 43	6 56 51	7 0 1	7 3 15	7 6 33	7 8 3
35	6 37 13	6 40 13	6 43 15	6 46 20	6 49 27	6 52 36	6 55 48	6 59 4	7 2 22	7 5 44	7 9 10	7 10 44
36	6 38 37	6 41 45	6 45 54	6 48 6	6 51 20	6 54 37	6 57 57	7 1 20	7 4 47	7 8 17	7 11 51	7 13 29
37	6 40 5	6 43 19	6 46 36	6 49 55	6 53 17	6 56 41	7 0 9	7 3 40	7 7 15	7 10 54	7 14 37	7 16 19
38	6 41 34	6 44 56	6 48 20	6 51 47	6 55 17	6 58 49	7 2 25	7 6 5	7 9 48	7 13 36	7 17 28	7 19 14
39	6 43 6	6 46 36	6 50 8	6 53 42	6 57 20	7 1 1	7 4 46	7 8 34	7 12 26	7 16 23	7 20 25	7 22 16
40	6 44 41	6 48 18	6 51 58	6 55 41	6 59 28	7 3 17	7 7 10	7 12 8	7 15 10	7 19 16	7 23 28	7 25 23
41	6 46 19	6 50 4	6 53 53	6 57 44	7 1 39	7 5 38	7 9 40	7 13 47	7 17 58	7 22 15	7 26 37	7 28 37
42	6 47 59	6 51 54	6 55 51	6 59 51	7 3 55	7 8 3	7 12 15	7 16 31	7 20 53	7 25 20	7 29 53	7 31 57
43	6 49 44	6 53 47	6 57 53	7 2 2	7 6 16	7 10 33	7 14 55	7 19 22	7 23 54	7 28 32	7 33 16	7 35 26
44	6 51 32	6 55 44	6 59 59	7 4 18	7 8 41	7 13 9	7 17 41	7 22 19	7 27 2	7 31 52	7 36 48	7 39 4
45	6 53 24	6 57 45	7 2 10	7 6 39	7 11 13	7 15 51	7 20 34	7 25 23	7 30 18	7 35 19	7 40 28	7 42 50
46	6 55 20	6 59 51	7 4 26	7 9 6	7 13 50	7 18 39	7 23 33	7 28 34	7 33 41	7 38 56	7 44 18	7 46 46
47	6 57 20	7 2 2	7 6 48	7 11 38	7 16 33	7 21 34	7 26 41	7 31 54	7 37 14	7 42 42	7 48 19	7 50 53
48	6 59 26	7 4 18	7 9 15	7 14 17	7 19 24	7 24 37	7 29 56	7 35 22	7 40 56	7 46 39	7 52 30	7 55 12
49	7 1 36	7 6 40	7 11 49	7 17 3	7 22 22	7 27 48	7 33 20	7 39 1	7 44 49	7 50 47	7 56 55	7 59 44
50	7 3 53	7 9 9	7 14 29	7 19 56	7 25 28	7 31 8	7 36 54	7 42 50	7 48 54	7 55 8	8 1 33	8 4 31
51	7 6 16	7 11 44	7 17 17	7 22 57	7 28 44	7 34 37	7 40 39	7 46 50	7 53 11	7 59 43	8 6 27	8 9 33
52	7 8 45	7 14 26	7 20 14	7 26 8	7 32 9	7 38 18	7 44 36	7 51 4	7 57 43	8 4 34	8 11 38	8 14 54
53	7 11 22	7 17 17	7 23 19	7 29 28	7 35 45	7 42 10	7 48 46	7 55 32	8 2 30	8 9 41	8 17 8	8 20 35
54	7 14 7	7 20 17	7 26 34	7 32 59	7 39 32	7 46 16	7 53 9	8 0 15	8 7 34	8 15 9	8 23 0	8 26 38
55	7 17 0	7 23 36	7 30 0	7 36 42	7 43 33	7 50 35	7 57 49	8 5 17	8 12 59	8 20 58	8 29 16	8 33 7
56	7 20 4	7 26 46	7 33 38	7 40 38	7 47 49	7 55 11	8 2 47	8 10 38	8 18 45	8 27 11	8 36 0	8 40 6
57	7 23 18	7 30 19	7 37 28	7 44 49	7 52 20	8 0 5	8 8 5	8 16 21	8 24 56	8 33 54	8 43 16	8 47 38
58	7 26 44	7 34 4	7 41 34	7 49 16	7 57 10	8 5 19	8 13 45	8 22 30	8 31 36	8 41 8	8 51 9	8 55 51
59	7 30 23	7 38 4	7 45 56	7 54 1	8 2 20	8 10 56	8 19 51	8 29 8	8 38 50	8 49 1	8 59 47	9 4 51
60	7 34 17	7 42 20	7 50 37	7 59 7	8 7 54	8 17 0	8 26 27	8 36 19	8 46 41	8 57 39	9 9 18	9 14 49
61	7 38 11	7 46 55	7 55 38	8 4 36	8 13 54	8 23 32	8 33 37	8 44 10	8 55 19	9 7 10	9 19 54	9 25 59
62	7 42 56	7 51 51	8 1 3	8 10 32	8 20 24	8 30 40	8 41 26	8 52 47	9 4 52	9 17 49	9 31 53	9 38 40
63	7 47 46	7 57 11	8 6 55	8 16 59	8 27 29	8 38 29	8 50 4	9 2 21	9 15 32	9 29 51	9 45 40	9 53 26
64	7 53 0	8 2 58	8 13 18	8 24 2	8 35 16	8 47 6	8 59 38	9 13 4	9 27 38	9 43 43	10 1 58	10 11 11
65	7 58 42	8 9 17	8 20 18	8 31 47	8 43 52	8 56 41	9 10 23	9 25 14	9 41 37	10 0 11	10 22 11	10 33 53
66	8 4 56	8 16 13	8 28 0	8 40 32	8 53 28	9 7 28	9 22 38	9 39 20	9 58 15	10 20 38	10 49 45	11 15 54
66°33′	8 8 38	8 20 20	8 32 36	8 45 31	8 59 15	9 14 2	9 30 10	9 48 10	10 8 58	10 34 38	11 12 27	12 0 0

N.B.—The Apparent Time of Sunset, when latitude and declination are of different names, or the Apparent Time of Sunrise, when latitude and declination are of the same name, is obtained by deducting the tabular figures from 12 hours.

Table V—Equation of Time at Greenwich Apparent Noon, as applied to Apparent Time to get the equivalent Mean-Time

January			February			March			April			May			June		
⊙ Long.	Eq. of T.		⊙ Long.	Eq. of T.		⊙ Long.	Eq. of T.		⊙ Long.	Eq. of T.		⊙ Long.	Eq. of T.		⊙ Long.	Eq. of T.	
	M.	S.		M.	S.		M.	S.		M.	S.		M.	S.		M.	S.
	+			+			+			+			−			−	
280°	3	20	311°	13	31	339°	12	47	10°	4	25	40°	2	51	70°	2	28
281	3	44	312	13	40	340	12	36	11	4	7	41	2	58	71	2	19
282	4	12	313	14	48	341	12	25	12	3	48	42	3	6	72	2	9
283	4	39	314	13	55	342	12	13	13	3	30	43	3	12	73	1	59
284	5	7	315	14	1	343	12	0	14	3	12	44	3	18	74	1	48
285	5	33	316	14	6	344	11	47	15	2	55	45	3	24	75	1	37
286	5	59	317	14	11	345	11	34	16	2	37	46	3	28	76	1	26
287	6	24	318	14	15	346	11	20	17	2	20	47	3	32	77	1	15
288	6	50	319	14	18	347	11	6	18	2	6	48	3	36	78	1	3
289	7	15	320	14	20	348	10	51	19	1	45	49	3	40	79	0	50
290	7	38	321	14	22	349	10	36	20	1	28	50	3	42	80	0	38
291	8	2	322	14	23	350	10	20	21	1	11	51	3	44	81	0	25
292	8	25	323	14	23	351	10	4	22	0	53	52	3	46	82	0	13
293	8	47	324	14	22	352	9	48	23	0	37	53	3	46	83	+ 0	1
294	9	9	325	14	20	353	9	32	24	0	23	54	3	47	84	0	12
295	9	30	326	14	17	354	9	15	25	0	8	55	3	47	85	0	27
296	9	50	327	14	14	355	8	57	26	− 0	7	56	3	45	86	0	41
297	10	10	328	14	11	356	8	40	27	0	21	57	3	43	87	0	54
298	10	29	329	14	6	357	8	22	28	0	36	58	3	41	88	1	8
299	10	48	330	14	1	358	8	5	29	0	50	59	3	38	89	1	21
300	11	5	331	13	56	359	7	47	30	1	4	60	3	35	90	1	35
301	11	22	332	13	49	360	7	29	31	1	17	61	3	30	91	1	49
302	11	38	333	13	42	1	7	11	32	1	29	62	3	27	92	2	2
303	11	54	334	13	34	2	6	53	33	1	41	63	3	20	93	2	14
304	12	9	335	13	26	3	6	34	34	1	53	64	3	14	94	2	25
305	12	22	336	13	17	4	6	16	35	2	3	65	3	8	95	2	38
306	12	36	337	13	8	5	5	57	36	2	14	66	3	1	96	2	56
307	12	49	338	12	58	6	5	39	37	2	24	67	2	54	97	3	8
308	13	1				7	5	20	38	2	33	68	2	46			
309	13	11				8	5	1	39	2	43	69	2	38			
310	13	22				9	4	43									

Table V—Equation of Time at Greenwich Apparent Noon, as applied to Apparent Time to get the equivalent Mean-Time —(Contd.)

July			August			September			October			November			December		
⊙ Long.	Eq. of T.		⊙ Long.	Eq. of T.		⊙ Long.	Eq. of T.		⊙ Long.	Eq. of T.		⊙ Long.	Eq. of T.		⊙ Long.	Eq. of T.	
	M.	S.		M.	S.		M.	S.		M.	S.		M.	S.		M.	S.
	+			+			−			−			−			−	
98°	3	21	128°	6	15	159°	0	6	187°	9	56	218°	16	19	249°	10	56
99	3	25	129	6	12	160	0	25	188	10	15	219	16	20	250	10	34
100	3	46	130	6	8	161	0	45	189	10	25	220	16	21	251	10	10
101	3	58	131	6	3	162	1	6	190	10	44	221	16	21	252	9	46
102	4	10	132	5	57	163	1	22	191	11	13	222	16	21	253	9	26
103	4	21	133	5	51	164	1	47	192	11	33	223	16	19	254	8	57
104	4	31	134	5	45	165	2	8	193	11	47	224	16	17	255	8	33
105	4	41	135	5	37	166	2	29	194	12	7	225	16	14	256	8	7
106	4	52	136	5	29	167	2	49	195	12	25	226	16	10	257	7	39
107	4	59	137	5	21	168	3	11	196	12	41	227	16	5	258	7	14
108	5	10	138	5	11	169	3	33	197	12	57	228	16	0	259	6	47
109	5	19	139	5	2	170	3	55	198	13	13	229	15	54	260	6	20
110	5	27	140	4	51	171	4	17	199	13	29	230	15	47	261	5	57
111	5	34	141	4	40	172	4	38	200	13	43	231	15	38	262	5	25
112	5	42	142	4	28	173	5	0	201	13	57	232	15	29	263	4	56
113	5	48	143	4	15	174	5	22	202	14	11	233	15	19	264	4	28
114	5	55	144	4	4	175	5	44	203	14	24	234	15	9	265	3	59
115	6	0	145	3	50	176	6	6	204	14	37	235	14	58	266	3	30
116	6	4	146	3	36	177	6	27	205	14	49	236	14	45	267	3	1
117	6	8	147	3	21	178	6	49	206	15	0	237	14	32	268	2	32
118	6	12	148	3	7	179	7	10	207	15	10	238	14	19	269	2	2
119	6	15	149	2	51	180	7	31	208	15	20	239	14	4	270	1	33
120	6	18	150	2	35	181	7	53	209	15	29	240	13	48	271	1	3
121	6	20	151	2	19	182	8	14	210	15	38	241	13	32	272	0	34
122	6	21	152	2	2	183	8	35	211	15	45	242	13	15	273	0	4
123	6	22	153	1	46	184	8	56	212	15	53	243	12	56	274	+ 0	25
124	6	21	154	1	28	185	9	16	213	15	59	244	12	38	275	0	54
125	6	20	155	1	10	186	9	36	214	16	4	245	12	19	276	1	24
126	6	19	156	0	52				215	16	9	246	12	0	277	1	40
127	6	17	157	0	34				216	16	13	247	11	39	278	2	20
			158	0	14				217	16	16	248	11	17	279	3	0

Table VI—Ternary Proportional Logarithms.

	0°	1°	2°	3°	4°	5°	6°	7°	8°	9°	10°
	Infinite	2·25527	1·95424	1·77815	1·65321	1·55630	1·47712	1·41017	1·35218	1·30103	1·25527
1	4·03342	2·24809	1·95064	1·77575	1·65141	1·55486	1·47592	1·40914	1·35128	1·30023	1·25455
2	3·73239	2·24103	1·94706	1·77335	1·64961	1·55342	1·47472	1·40811	1·35038	1·29942	1·25383
3	3·55630	2·23408	1·94352	1·77097	1·64782	1·55198	1·47352	1·40708	1·34948	1·29862	1·25311
4	3·43136	2·22724	1·94000	1·76861	1·64603	1·55055	1·47232	1·40606	1·34858	1·29782	1·25239
5	3·33445	2·22051	1·93651	1·76625	1·64426	1·54912	1·47113	1·40503	1·34768	1·29703	1·25167
6	3·25527	2·21388	1·93305	1·76391	1·64249	1·54770	1·46994	1·40401	1·34679	1·29623	1·25095
7	3·18833	2·20735	1·92962	1·76158	1·64073	1·54629	1·46876	1·40300	1·34589	1·29544	1·25024
8	3·13033	2·20091	1·92621	1·75927	1·63897	1·54487	1·46758	1·40198	1·34500	1·29464	1·24952
9	3·07918	2·19457	1·92283	1·75696	1·63722	1·54347	1·46640	1·40097	1·34411	1·29385	1·24881
10	3·03342	2·18833	1·91948	1·75467	1·63548	1·54206	1·46522	1·39996	1·34323	1·29306	1·24809
11	2·99203	2·18217	1·91615	1·75239	1·63375	1·54066	1·46405	1·39895	1·34234	1·29227	1·24738
12	2·95424	2·17609	1·91285	1·75012	1·63202	1·53927	1·46288	1·39794	1·34146	1·29148	1·24667
13	2·91948	2·17010	1·90957	1·74787	1·63030	1·53788	1·46171	1·39694	1·34058	1·29070	1·24596
14	2·88730	2·16419	1·90632	1·74562	1·62859	1·53649	1·46055	1·39593	1·33970	1·28991	1·24526
15	2·85733	2·15836	1·90309	1·74339	1·62688	1·53511	1·45938	1·39493	1·33882	1·28913	1·24455
16	2·82930	2·15261	1·89988	1·74117	1·62518	1·53374	1·45824	1·39394	1·33794	1·28835	1·24384
17	2·80297	2·14693	1·89670	1·73896	1·62349	1·53236	1·45708	1·39294	1·33707	1·28757	1·24314
18	2·77815	2·14133	1·89354	1·73676	1·62180	1·53100	1·45593	1·39195	1·33619	1·28679	1·24244
19	2·75467	2·13580	1·89041	1·73457	1·62012	1·52963	1·45478	1·39096	1·33532	1·28601	1·24173
20	2·73239	2·13033	1·88730	1·73239	1·61845	1·52827	1·45364	1·38997	1·33445	1·28524	1·24103
21	2·71120	2·12494	1·88420	1·73023	1·61678	1·52692	1·45250	1·38899	1·33359	1·28446	1·24033
22	2·69100	2·11961	1·88114	1·72807	1·61512	1·52557	1·45136	1·38800	1·33272	1·28369	1·23963
23	2·67170	2·11435	1·87809	1·72593	1·61347	1·52422	1·45022	1·38702	1·33186	1·28292	1·23894
24	2·65321	2·10914	1·87506	1·72379	1·61182	1·52288	1·44909	1·38604	1·33099	1·28215	1·23824
25	2·63548	2·10400	1·87206	1·72167	1·61018	1·52154	1·44796	1·38506	1·33013	1·28138	1·23754
26	2·61845	2·09893	1·86907	1·71956	1·60854	1·52021	1·44684	1·38409	1·32927	1·28061	1·23685
27	2·60206	2·09390	1·86611	1·71745	1·60691	1·51888	1·44571	1·38312	1·32842	1·27984	1·23616
28	2·58627	2·08894	1·86316	1·71536	1·60529	1·51755	1·44459	1·38215	1·32756	1·27908	1·23546
29	2·57103	2·08403	1·86024	1·71328	1·60367	1·51623	1·44347	1·38118	1·32671	1·27831	1·23477
30	2·53630	2·07918	1·85733	1·71120	1·60206	1·51491	1·44236	1·38021	1·32585	1·27755	1·23408
31	2·54206	2·07438	1·85445	1·70914	1·60045	1·51360	1·44125	1·37925	1·32500	1·27679	1·23339
32	2·52827	2·06964	1·85158	1·70709	1·59885	1·51229	1·44014	1·37829	1·32415	1·27603	1·23271
33	2·51491	2·06494	1·84873	1·70504	1·59726	1·51098	1·43903	1·37733	1·32331	1·27527	1·23202
34	2·50194	2·06030	1·84590	1·70301	1·59567	1·50968	1·43793	1·37637	1·32246	1·27451	1·23133
35	2·48936	2·05570	1·84309	1·70099	1·59409	1·50838	1·43683	1·37541	1·32162	1·27376	1·23065
36	2·47712	2·05115	1·84030	1·69897	1·59251	1·50708	1·43573	1·37446	1·32077	1·27300	1·22997
37	2·46522	2·04665	1·83752	1·69696	1·59094	1·50579	1·43463	1·37351	1·31993	1·27225	1·22928
38	2·45364	2·04220	1·83477	1·69497	1·58938	1·50451	1·43354	1·37256	1·31909	1·27150	1·22860
39	2·44236	2·03779	1·83203	1·69298	1·58782	1·50322	1·43245	1·37161	1·31826	1·27075	1·22792
40	2·43136	2·03342	1·82930	1·69100	1·58627	1·50194	1·43136	1·37067	1·31742	1·27000	1·22724
41	2·42064	2·02910	1·82660	1·68903	1·58472	1·50067	1·43028	1·36972	1·31659	1·26925	1·22657
42	2·41017	2·02482	1·82391	1·68707	1·58317	1·49940	1·42920	1·36878	1·31575	1·26850	1·22589
43	2·39996	2·02060	1·82124	1·68512	1·58164	1·49813	1·42812	1·36784	1·31492	1·26776	1·22521
44	2·38997	2·01639	1·81858	1·68318	1·58011	1·49687	1·42704	1·36691	1·31409	1·26701	1·22454
45	2·38021	2·01223	1·81594	1·68124	1·57858	1·49560	1·42597	1·36597	1·31326	1·26627	1·22386
46	2·37067	2·00812	1·81332	1·67932	1·57706	1·49435	1·42490	1·36504	1·31244	1·26553	1·22319
47	2·36133	2·00404	1·81071	1·67740	1·57554	1·49309	1·42383	1·36411	1·31161	1·26479	1·22252
48	2·35218	2·00000	1·80811	1·67549	1·57403	1·49184	1·42276	1·36318	1·31079	1·26405	1·22185
49	2·34323	1·99600	1·80554	1·67359	1·57253	1·49060	1·42170	1·36225	1·30997	1·26331	1·22118
50	2·33445	1·99203	1·80297	1·67170	1·57103	1·48936	1·42064	1·36133	1·30915	1·26257	1·22051
51	2·32585	1·98810	1·80043	1·66981	1·56953	1·48812	1·41958	1·36040	1·30833	1·26184	1·21984
52	2·31742	1·98421	1·79790	1·66794	1·56804	1·48688	1·41853	1·35948	1·30751	1·26110	1·21918
53	2·30915	1·98035	1·79538	1·66607	1·56656	1·48565	1·41747	1·35856	1·30670	1·26037	1·21851
54	2·30103	1·97652	1·79287	1·66421	1·56508	1·48442	1·41642	1·35765	1·30588	1·25964	1·21785
55	2·29306	1·97273	1·79039	1·66236	1·56360	1·48320	1·41538	1·35673	1·30507	1·25891	1·21718
56	2·28524	1·96897	1·78791	1·66051	1·56213	1·48197	1·41433	1·35582	1·30426	1·25818	1·21652
57	2·27755	1·96524	1·78545	1·65868	1·56067	1·48076	1·41329	1·35491	1·30345	1·25745	1·21586
58	2·27000	1·96154	1·78300	1·65685	1·55921	1·47954	1·41225	1·35400	1·30264	1·25672	1·21520
59	2·26257	1·95788	1·78057	1·65503	1·55775	1·47833	1·41121	1·35309	1·30183	1·25600	1·21454
60	2·25527	1·95424	1·77815	1·65321	1·55630	1·47712	1·41017	1·35218	1·30103	1·25527	1·21388

Table VI—Ternary Proportional Logarithms—(Contd.)

	11°	12°	13°	14°	15°	16°	17°	18°	19°	20°	21°
0′	1·21388	1·17609	1·14133	1·10914	1·07918	1·05115	1·02482	1·00000	0·97652	95424	93305
1	1·21322	1·17549	1·14077	1·10863	1·07870	1·05070	1·02440	0·99960	97614	95388	93271
2	1·21257	1·17489	1·14022	1·10811	1·07822	1·05025	1·02397	0·99920	97576	95352	93236
3	1·21191	1·17429	1·13966	1·10760	1·07774	1·04980	1·02355	0·99880	97538	95316	93202
4	1·21126	1·17369	1·13911	1·10708	1·07726	1·04935	1·02312	0·99839	97500	95280	93168
5	1·21060	1·17309	1·13855	1·10657	1·07678	1·04890	1·02270	0·99799	97462	95244	93133
6	1·20995	1·17249	1·13800	1·10605	1·07630	1·04845	1·02228	0·99759	97424	95208	93099
7	1·20930	1·17189	1·13745	1·10554	1·07582	1·04800	1·02185	0·99719	97386	95172	93065
8	1·20865	1·17129	1·13690	1·10503	1·07534	1·04755	1·02143	0·99679	97348	95136	93030
9	1·20800	1·17070	1·13635	1·10452	1·07486	1·04710	1·02101	0·99640	97310	95100	92996
10	1·20735	1·17010	1·13580	1·10400	1·07438	1·04665	1·02059	0·99600	97273	95064	92962
11	1·20670	1·16951	1·13525	1·10349	1·07391	1·04620	1·02017	0·99560	97235	95028	92928
12	1·20605	1·16891	1·13470	1·10298	1·07343	1·04576	1·01974	0·99520	97197	94992	92894
13	1·20541	1·16832	1·13415	1·10247	1·07295	1·04531	1·01932	0·99480	97159	94956	92860
14	1·20476	1·16773	1·13360	1·10197	1·07248	1·04486	1·01890	0·99441	97122	94921	92825
15	1·20412	1·16714	1·13306	1·10146	1·07200	1·04442	1·01848	0·99401	97084	94885	92791
16	1·20348	1·16655	1·13251	1·10095	1·07153	1·04397	1·01806	0·99361	97047	94849	92757
17	1·20284	1·16596	1·13197	1·10044	1·07105	1·04353	1·01764	0·99322	97009	94813	92723
18	1·20219	1·16537	1·13142	1·09994	1·07058	1·04308	1·01723	0·99282	96972	94778	92689
19	1·20155	1·16478	1·13088	1·09943	1·07011	1·04264	1·01681	0·99243	96934	94742	92655
20	1·20091	1·16419	1·13033	1·09893	1·06964	1·04220	1·01639	0·99203	96897	94706	92621
21	1·20028	1·16361	1·12979	1·09842	1·06916	1·04175	1·01597	0·99164	96859	94671	92587
22	1·19964	1·16302	1·12925	1·09792	1·06869	1·04131	1·01556	0·99124	96822	94635	92554
23	1·19900	1·16243	1·12871	1·09741	1·06822	1·04087	1·01514	0·99085	96784	94600	92520
24	1·19837	1·16185	1·12817	1·09691	1·06775	1·04043	1·01472	0·99045	96747	94564	92486
25	1·19773	1·16127	1·12763	1·09641	1·06728	1·03999	1·01431	0·99006	96710	94529	92452
26	1·19710	1·16068	1·12709	1·09591	1·06681	1·03955	1·01389	0·98967	96673	94493	92418
27	1·19647	1·16010	1·12655	1·09540	1·06634	1·03911	1·01348	0·98928	96635	94458	92385
28	1·19584	1·15952	1·12601	1·09490	1·06588	1·03867	1·01306	0·98888	96598	94423	92351
29	1·19520	1·15894	1·12548	1·09440	1·06541	1·03823	1·01265	0·98849	96561	94387	92317
30	1·19457	1·15836	1·12494	1·09390	1·06494	1·03779	1·01223	0·98810	96524	94352	92283
31	1·19395	1·15778	1·12440	1·09341	1·06447	1·03735	1·01182	0·98771	96487	94317	92250
32	1·19332	1·15721	1·12387	1·09291	1·06401	1·03691	1·01141	0·98732	96450	94281	92216
33	1·19269	1·15663	1·12333	1·09241	1·06354	1·03647	1·01100	0·98693	96413	94246	92183
34	1·19206	1·15605	1·12280	1·09191	1·06308	1·03604	1·01058	0·98654	96376	94211	92149
35	1·19144	1·15548	1·12227	1·09142	1·06261	1·03560	1·01017	0·98615	96339	94176	92115
36	1·19081	1·15490	1·12173	1·09092	1·06215	1·03516	1·00976	0·98576	96302	94141	92082
37	1·19019	1·15433	1·12120	1·09042	1·06168	1·03473	1·00935	0·98537	96265	94105	92048
38	1·18957	1·15375	1·12067	1·08993	1·06122	1·03429	1·00894	0·98498	96228	94070	92015
39	1·18895	1·15318	1·12014	1·08943	1·06076	1·03386	1·00853	0·98459	96191	94035	91981
40	1·18833	1·15261	1·11961	1·08894	1·06030	1·03342	1·00812	0·98421	96154	94000	91948
41	1·18771	1·15204	1·11908	1·08845	1·05983	1·03299	1·00771	0·98382	96117	93965	91915
42	1·18709	1·15147	1·11855	1·08796	1·05937	1·03256	1·00730	0·98343	96081	93930	91881
43	1·18647	1·15090	1·11802	1·08746	1·05891	1·03212	1·00689	0·98304	96044	93895	91848
44	1·18585	1·15033	1·11750	1·08697	1·05845	1·03169	1·00648	0·98266	96007	93860	91815
45	1·18523	1·14976	1·11697	1·08648	1·05799	1·03126	1·00607	0·98227	95971	93825	91781
46	1·18462	1·14919	1·11644	1·08599	1·05753	1·03083	1·00567	0·98189	95934	93791	91748
47	1·18400	1·14863	1·11592	1·08550	1·05707	1·03039	1·00526	0·98150	95897	93756	91715
48	1·18339	1·14806	1·11539	1·08501	1·05662	1·02996	1·00485	0·98111	95861	93721	91682
49	1·18278	1·14750	1·11487	1·08452	1·05616	1·02953	1·00445	0·98073	95824	93686	91648
50	1·18217	1·14693	1·11435	1·08403	1·05570	1·02910	1·00404	0·98035	95788	93651	91615
51	1·18155	1·14637	1·11382	1·08355	1·05524	1·02867	1·00363	0·97996	95751	93617	91582
52	1·18094	1·14581	1·11330	1·08306	1·05479	1·02824	1·00323	0·97958	95715	93582	91549
53	1·18033	1·14524	1·11278	1·08257	1·05433	1·02781	1·00282	0·97919	95678	93547	91516
54	1·17973	1·14468	1·11226	1·08209	1·05388	1·02739	1·00242	0·97881	95642	93513	91483
55	1·17912	1·14412	1·11174	1·08160	1·05342	1·02696	1·00202	0·97843	95606	93478	91450
56	1·17851	1·14356	1·11122	1·08112	1·05297	1·02653	1·00161	0·97805	95569	93443	91417
57	1·17790	1·14300	1·11070	1·08063	1·05251	1·02610	1·00121	0·97756	95533	93409	91384
58	1·17730	1·14244	1·11018	1·08015	1·05206	1·02568	1·00080	0·97728	95497	93374	91351
59	1·17669	1·14189	1·10966	1·07966	1·05161	1·02525	1·00040	0·97690	95460	93340	91318
60	1·17609	1·14133	1·10914	1·07918	1·05115	1·02482	1·00000	0·97652	95424	93305	91285

Table VI—Ternary Proportional Logarithms—(Contd.)

	22°	23°	24°	25°	26°	27°	28°	29°	30°	31°	32°	33°	34°	35°	36°
0′	91285	89354	87506	85733	84030	82391	80811	79287	77815	76391	75012	73676	72379	71120	69897
1	91252	89323	87476	85704	84002	82364	80786	79262	77791	76368	74990	73654	72358	71100	69877
2	91219	89292	87446	85675	83974	82337	80760	79238	77767	76344	74967	73632	72337	71079	69857
3	91186	89260	87416	85646	83946	82311	80734	79213	77743	76321	74944	73610	72316	71058	69837
4	91154	89229	87386	85618	83919	82284	80708	79188	77719	76298	74922	73588	72294	71038	68817
5	91121	89197	87356	85589	83891	82257	80682	79163	77695	76274	74899	73566	72273	71017	69797
6	91088	89166	87326	85560	83863	82230	80657	79138	77671	76251	74877	73544	72252	70997	69777
7	91055	89135	87296	85531	83835	82204	80631	79113	77647	76228	74854	73523	72231	70976	69756
8	91023	89103	87266	85502	83808	82177	80605	79088	77623	76205	74832	73501	72209	70955	69736
9	90990	89072	87236	85473	83780	82150	80579	79063	77599	76181	74809	73479	72188	70935	69716
10	90957	89041	87206	85445	83752	82124	80554	79039	77575	76158	74787	73457	72167	70914	69696
11	90925	89010	87176	85416	83725	82097	80528	79014	77551	76135	74764	73435	72146	70894	69676
12	90892	88978	85146	85387	83697	82070	80502	78989	77527	76112	74742	73413	72125	70873	69656
13	90859	88947	87116	85358	83670	82044	80477	78964	77503	76089	74719	73392	72103	70852	69636
14	90827	88916	87086	85330	83642	82017	80451	78939	77479	76065	74697	73370	72082	70832	69616
15	90794	88885	87056	85301	83614	81991	80425	78915	77455	76042	74674	73348	72061	70811	69596
16	90762	88854	87026	85272	83587	81964	80400	78890	77431	76019	74652	73326	72040	70791	69576
17	90729	88823	86996	85244	83559	81938	80374	78865	77407	75996	74629	73305	72019	70770	69557
18	90697	88792	86967	85215	83532	81911	80349	78840	77383	75973	74607	73283	71998	70750	69537
19	90664	88761	86937	85187	83504	81884	80323	78816	77359	75950	74585	73261	71977	70729	69517
20	90632	88730	86907	85158	83477	81858	80297	78791	77335	75927	74562	73239	71956	70709	69497
21	90599	88699	86877	85129	83449	81832	80272	78766	77311	75903	74540	73218	71835	70688	69477
22	90567	88668	86848	85101	83422	81805	80246	78742	77288	75880	74517	73196	71914	70668	69457
23	90535	88637	86818	85072	83394	81779	80221	78717	77264	75857	74495	73174	71892	70647	69437
24	90502	88606	86788	85044	83367	81752	80195	78693	77240	75834	74473	73153	71871	70627	69417
25	90470	88575	86759	85015	83339	81726	80170	78668	77216	75811	74450	73131	71850	70606	69397
26	90438	88544	86729	84987	83312	81699	80144	78643	77192	75788	74428	73109	71829	70586	69377
27	90406	88513	86699	84958	83285	81673	80119	78619	77169	75765	74406	73088	71808	70566	69358
28	90373	88482	86670	84930	83257	81647	80094	78594	77145	75742	74383	73066	71787	70545	69338
29	90341	88451	86640	84902	83230	81620	80068	78570	77121	75719	74361	73044	71766	70525	69318
30	90309	88420	86611	84873	83203	81594	80043	78545	77097	75696	74339	73023	71745	70504	69298
31	90277	88390	86581	84845	83175	81568	80017	78521	77074	75673	74317	73001	71724	70484	69278
32	90245	88359	86552	84816	83148	81541	79992	78496	77050	75650	74294	72980	71703	70464	69258
33	90213	88328	86522	84788	83121	81515	79967	78472	77026	75627	74272	72958	71682	70443	69239
34	90181	88297	86493	84760	83094	81489	79941	78447	77002	75604	74250	72936	71662	70423	69219
35	90148	88267	86463	84732	83066	81463	79916	78423	76979	75581	74228	72915	71641	70403	69199
36	90116	88236	86434	84703	83039	81436	79891	78398	76955	75559	74205	72893	71620	70382	69179
37	90084	88205	86404	84675	83012	81410	79865	78374	76931	75536	74183	72872	71599	70362	69159
38	90052	88175	86375	84647	82985	81384	79840	78349	76908	75513	74161	72850	71578	70342	69140
39	90020	88144	86346	84619	82958	81358	79815	78325	76884	75490	74139	72829	71557	70321	69120
40	89988	88114	86316	84590	82930	81332	79790	78300	76861	75467	74117	72807	71536	70301	69100
41	89957	88083	86287	84562	82903	81305	79764	78276	76837	75444	74095	72786	71515	70281	69080
42	89925	88052	86258	84534	82876	81279	79739	78252	76813	75421	74072	72764	71494	70260	69061
43	89893	88022	86228	84506	82849	81253	79714	78227	76790	75398	74050	72743	71473	70240	69041
44	89861	87991	86199	84478	82822	81227	79689	78203	76766	75376	74028	72721	71453	70220	69021
45	89829	87961	86170	84450	82795	81201	79663	78179	76743	75353	74006	72700	71432	70200	69002
46	89797	87930	86140	84421	82768	81175	79638	78154	76719	75330	73984	72678	71411	70179	68982
47	89766	87900	86111	84393	82741	81149	79613	78130	76696	75307	73962	72657	71390	70159	68962
48	89734	87870	86082	84365	82714	81123	79588	78106	76672	75285	73940	72636	71369	70139	68942
49	89702	87839	86053	84337	82687	81097	79563	78081	76649	75262	73918	72614	71349	70119	68923
50	89670	87809	86024	84309	82660	81071	79538	78057	76625	75239	73926	72593	71328	70099	68903
51	89639	87778	85995	84281	82633	81045	79513	78033	76602	75216	73874	72571	71307	70078	68884
52	89607	87748	85965	84253	82606	81019	79488	78009	76578	75194	73852	72550	71286	70058	68864
53	89575	87718	85936	84225	82579	80993	79463	77984	76555	75171	73830	72529	71265	70038	68844
54	89544	87687	85907	84197	82552	80967	79437	77960	76531	75148	73808	72507	71245	70018	68825
55	89512	87657	85878	84169	82525	80941	79412	77936	76508	75126	73786	72486	71224	69998	68805
56	89481	87627	85849	84141	82498	80915	79387	77912	76485	75103	73764	72465	71203	69977	68785
57	89449	87597	85820	84114	82471	80889	79362	77888	76461	75080	73742	72443	71183	69957	68766
58	89417	87566	85791	84086	82445	80863	79337	77863	76438	75058	73720	72422	71162	69937	68746
59	89386	87536	85762	84058	82418	80837	79312	77839	76414	75035	73698	72401	71141	69917	68727
60	89354	87506	85733	84030	82391	80811	79287	77815	76391	75012	73676	72379	71120	69897	68707

Table VI—Ternary Proportional Logarithms—(Contd.)

	37°	38°	39°	40°	41°	42°	43°	44°	45°	46°	47°	48°	49°	50°	51°
0′	68707	67549	66421	65321	64249	63202	62180	61182	60206	59251	58317	57403	56508	55630	54770
1	68688	67530	66402	65303	64231	63185	62164	61166	60190	59236	58302	57388	56493	55616	54756
2	68668	67511	66384	65285	64214	63168	62147	61149	60174	59220	58287	57373	56478	55601	54742
3	68648	67492	66365	65267	64196	63151	62130	61133	60158	59204	58271	57358	56463	55587	54728
4	68629	67473	66347	65249	64178	63133	62113	61116	60142	59189	58256	57343	56449	55572	54714
5	68609	67454	66328	65231	64161	63116	62096	61100	60126	59173	58241	57328	56434	55558	54699
6	68590	67435	66310	65213	64143	63099	62080	61083	60110	59157	58225	57313	56419	55543	54685
7	68570	67416	66291	65195	64125	63082	62063	61067	60094	59141	58210	57298	56404	55529	54671
8	68551	67397	66273	65177	64108	63065	62046	61051	60078	59126	58194	57283	56390	55515	54657
9	68531	67378	66254	65159	64090	63047	62029	61034	60061	59110	58179	57268	56375	55500	54643
10	68512	67359	66236	65141	64073	63030	62012	61018	60045	59094	58164	57253	56360	55486	54629
11	68492	67340	66217	65123	64055	63013	61996	61001	60029	59079	58148	57238	56345	55471	54614
12	68473	67321	66199	65105	64038	62996	61979	60985	60013	59063	58133	57223	56331	55457	54600
13	68454	67302	66180	65087	64020	62979	61962	60969	59997	59047	58118	57208	56316	55442	54586
14	68434	67283	66162	65069	64002	62962	61945	60952	59981	59032	58102	57193	56301	55428	54572
15	68415	67264	66143	65051	63985	62945	61929	60936	59965	59016	58087	57178	56287	55414	54558
16	68395	67245	66125	65033	63967	62927	61912	60920	59949	59000	58072	57163	56272	55399	54544
17	68376	67226	66106	65015	63950	62910	61895	60903	59933	58985	58056	57148	56257	55385	54530
18	68356	67207	66088	64997	63932	62893	61878	60887	59917	58969	58041	57133	56243	55370	54516
19	68337	67188	66070	64979	63915	62876	61862	60871	59901	58954	58026	57118	56228	55356	54501
20	68318	67170	66051	64961	63897	62859	61845	60854	59885	58938	58011	57103	56213	55342	54487
21	68298	67151	66033	64943	63880	62842	61828	60838	59870	58922	57995	57088	56199	55327	54473
22	68279	67132	66014	64925	63862	62825	61812	60822	59854	58907	57980	57073	56184	55313	54459
23	68259	67113	65996	64907	63845	62808	61795	60805	59838	58891	57965	57058	56169	55299	54445
24	68240	67094	65978	64889	63827	62791	61778	60789	59822	58875	57949	57043	56155	55284	54431
25	68221	67075	65959	64871	63810	62774	61762	60773	59806	58860	57934	57028	56140	55270	54417
26	68201	67056	65941	64853	63792	62757	61745	60756	59790	58844	57919	57013	56125	55255	54403
27	68182	67038	65923	64835	63775	62739	61728	60740	59774	58829	57904	56998	56111	55241	54389
28	68163	67019	65904	64818	63757	62722	61712	60724	59758	58813	57888	56983	56096	55227	54375
29	68143	67000	65886	64800	63740	62705	61695	60708	59742	58798	57873	56968	56081	55212	54361
30	68124	66981	65868	64782	63722	62688	61678	60691	59726	58782	57858	56953	56067	55198	54347
31	68105	66962	65849	64764	63705	62671	61662	60675	59710	58766	57843	56938	56052	55184	54332
32	68086	66944	65831	64746	63688	62654	61645	60659	59694	58751	57827	56923	56037	55169	54318
33	68066	66925	65813	64728	63670	62637	61628	60642	59678	58735	57812	56908	56023	55155	54304
34	68047	66906	65794	64710	63653	62620	61612	60626	59663	58720	57797	56893	56008	55141	54290
35	68028	66887	65776	64692	63635	62603	61595	60610	59647	58704	57782	56879	55994	55127	54276
36	68008	66869	65758	64675	63618	62586	61579	60594	59631	58689	57767	56864	55979	55112	54262
37	67989	66850	65739	64657	63601	62569	61562	60578	59615	58673	57751	56849	55964	55098	54248
38	67970	66831	65721	64639	63583	62552	61545	60561	59599	58658	57736	56834	55950	55084	54234
39	67951	66812	65703	64621	63566	62535	61529	60545	59583	58642	57721	56819	55935	55069	54220
40	67932	66794	65685	64603	63548	62518	61512	60529	59567	58627	57706	56804	55921	55055	54206
41	67912	66775	65666	64586	63531	62501	61496	60513	59551	58611	57691	56789	55906	55041	54192
42	67893	66756	65648	64568	63514	62484	61479	60496	59536	58596	57675	56774	55892	55026	54178
43	67874	66737	65630	64550	63496	62468	61463	60480	59520	58580	57660	56759	55877	55012	54164
44	67855	66719	65612	64532	63479	62451	61446	60464	59504	58565	57645	56745	55862	54998	54150
45	67836	66700	65594	64514	63462	62434	61429	60448	59488	58549	57630	56730	55848	54984	54136
46	67816	66681	65575	64497	63444	62417	61413	60432	59472	58534	57615	56715	55833	54969	54122
47	67797	66663	65557	64479	63427	62400	61396	60416	59457	58518	57600	56700	55819	54955	54108
48	67778	66644	65539	64461	63410	62383	61380	60399	59441	58503	57584	56685	55804	54941	54094
49	67759	66625	65521	64443	63392	62366	61363	60383	59425	58487	57569	56670	55790	54927	54080
50	67740	66607	65503	64426	63375	62349	61347	60367	59409	58472	57554	56656	55775	54912	54066
51	67721	66588	65484	64408	63358	62332	61330	60351	59393	58456	57539	56641	55761	54898	54052
52	67702	66570	65466	64390	63340	62315	61314	60335	59378	58441	57524	56626	55746	54884	54038
53	67682	66551	65448	64373	63323	62298	61297	60319	59362	58425	57509	56611	55732	54870	54024
54	67663	66532	65430	64355	63306	62282	61281	60303	59346	58410	57494	56596	55717	54855	54011
55	67644	66514	65412	64337	63289	62265	61264	60286	59330	58395	57479	56582	55703	54841	53997
56	67625	66495	65394	64320	63271	62248	61248	60270	59314	58379	57463	56567	55688	54827	53983
57	67606	66477	65376	64302	63254	62231	61231	60254	59299	58364	57448	56552	55674	54813	53969
58	67587	66458	65357	64284	63237	62214	61215	60238	59283	58348	57433	56537	55659	54799	53955
59	67568	66439	65339	64267	63220	62197	61198	60222	59267	58333	57418	56522	55645	54784	53941
60	67549	66421	65321	64249	63202	62180	61182	60206	59251	58317	57403	56508	55630	54770	53927

Table VI—Ternary Proportional Logarithms—(Contd.)

	52°	53°	54°	55°	56°	57°	58°	59°	60°	61°	62°	63°	64°	65°	66°
0′	53927	53100	52288	51491	50708	49940	49184	48442	47712	46994	46288	45593	44909	44236	43573
1	53913	53086	52274	51478	50696	49927	49172	48430	47700	46982	46276	45582	44898	44225	43562
2	53899	53072	52261	51465	50683	49914	49159	48418	47688	46971	46265	45570	44887	44214	43551
3	53885	53059	52248	51452	50670	49902	49147	48405	47676	46959	46253	45559	44875	44203	43540
4	53871	53045	52234	51438	50657	49889	49135	48393	47664	46947	46241	45547	44864	44191	43529
5	53857	53031	52221	51425	50644	49876	49122	48381	47652	46935	46230	45536	44853	44180	43518
6	53843	53018	52208	51412	50631	49864	49110	48369	47640	46923	46218	45524	44841	44169	43507
7	53830	53004	52194	51399	50618	49851	49097	48356	47628	46911	46206	45513	44830	44158	43496
8	53816	52991	52181	51386	50605	49838	49085	48344	47616	46899	46195	45501	44819	44147	43485
9	53802	52977	52167	51373	50592	49826	49072	48332	47604	46888	46183	45490	44808	44136	43474
10	53788	52963	52154	51360	50579	49813	49060	48320	47592	46876	46171	45478	44796	44125	43463
11	53774	52950	52141	51346	50566	49800	49047	48307	47580	46864	46160	45467	44785	44114	43452
12	53760	52936	52127	51333	50554	49788	49035	48295	47568	46852	46148	45456	44774	44102	43441
13	53746	52922	52114	51320	50541	49775	49023	48283	47556	46840	46137	45444	44762	44091	43431
14	53732	52909	52101	51307	50528	49762	49010	48271	47544	46828	46125	45433	44751	44080	43420
15	53719	52895	52087	51294	50515	49750	48998	48258	47532	46817	46113	45421	44740	44069	43409
16	53705	52882	52074	51281	50502	49737	48985	48246	47520	46805	46102	45410	44729	44058	43398
17	53691	52868	52061	51268	50489	49724	48973	48234	47508	46793	46090	45398	44717	44047	43387
18	53677	52855	52047	51255	50476	49712	48960	48222	47496	46781	46078	45387	44706	44036	43376
19	53663	52841	52034	51242	50464	49699	48948	48210	47484	46769	46067	45375	44695	44025	43365
20	53649	52827	52021	51229	50451	49687	48936	48197	47472	46758	46055	45364	44684	44014	43354
21	53636	52814	52007	51215	50438	49674	48923	48185	47460	46746	46044	45353	44672	44003	43343
22	53622	52800	51994	51202	50425	49661	48911	48173	47448	46734	46032	45341	44661	43992	43332
23	53608	52787	51981	51189	50412	49649	48898	48161	47436	46722	46020	45330	44650	43981	43321
24	53594	52773	51967	51176	50399	49636	48886	48149	47424	46710	46009	45318	44639	43969	43310
25	53580	52760	51954	51163	50387	49623	48874	48136	47412	46699	45997	45307	44627	43958	43300
26	53567	52746	51941	51150	50374	49611	48861	48124	47400	46687	45986	45295	44616	43947	43389
27	53553	52732	51927	51137	50361	49598	48849	48112	47388	46675	45974	45284	44605	43936	43278
28	53539	52719	51914	51124	50348	49586	48836	48100	47376	46663	45962	45273	44594	43925	43267
29	53525	52705	51901	51111	50335	49573	48824	48088	47364	46652	45951	45261	44583	43914	43256
30	53511	52692	51888	51098	50322	49560	48812	48076	47352	46640	45939	45250	44571	43903	43245
31	53498	52678	51874	51085	50310	49548	48799	48063	47340	46628	45928	45238	44560	43892	43234
32	53484	52665	51861	51072	50297	49535	48787	48051	47328	46616	45916	45227	44549	43881	43223
33	53470	52651	51848	51059	50284	49523	48775	48039	47316	46604	45905	45216	44538	43870	43212
34	53456	52638	51835	51046	50271	49510	48762	48027	47304	46593	45893	45204	44526	43859	43202
35	53442	52624	51821	51033	50258	49498	48750	48015	47292	46581	45881	45193	44515	43848	43191
36	53429	52611	51808	51020	50246	49485	48737	48003	47280	46569	45870	45182	44504	43837	43180
37	53415	52597	51795	51007	50233	49472	48725	47990	47268	46557	45858	45170	44493	43826	43169
38	53401	52584	51781	50994	50220	49460	48713	47978	47256	46546	45847	45159	44482	43815	43158
39	53387	52570	51768	50981	50207	49447	48700	47966	47244	46534	45835	45147	44470	43804	43147
40	53374	52557	51755	50968	50194	49435	48688	47954	47232	46522	45824	45136	44459	43793	43136
41	53360	52543	51742	50955	50182	49422	48676	47942	47220	46510	45812	45125	44448	43782	43126
42	53346	52530	51729	50942	50169	49410	48663	47930	47208	46499	45800	45113	44437	43771	43115
43	53332	52516	51715	50929	50156	49397	48651	47918	47196	46487	45789	45102	44426	43760	43104
44	53319	52503	51702	50916	50143	49385	48639	47906	47185	46475	45777	45091	44414	43749	43093
45	53305	52489	51689	50903	50131	49372	48626	47893	47173	46464	45766	45079	44403	43738	43082
46	53291	52476	51676	50890	50118	49360	48614	47881	47161	46452	45754	45068	44392	43727	43071
47	53278	52462	51662	50877	50105	49347	48602	47869	47149	46440	45743	45057	44381	43716	43060
48	53264	52449	51649	50864	50092	49334	48590	47857	47137	46428	45731	45045	44370	43705	43050
49	53250	52436	51636	50851	50080	49322	48577	47845	47125	46417	45720	45034	44359	43694	43039
50	53236	52422	51623	50838	50067	49309	48565	47833	47113	46405	45708	45022	44347	43683	43028
51	53223	52409	51610	50825	50054	49297	48553	47821	47101	46393	45697	45011	44336	43672	43017
52	53209	52395	51596	50812	50041	49284	48540	47809	47089	46382	45685	45000	44325	43661	43006
53	53195	52382	51583	50799	50029	49272	48528	47797	47077	46370	45674	44988	44314	43650	42995
54	53182	52368	51570	50786	50016	49259	48516	47785	47066	46358	45662	44977	44303	43639	42985
55	53168	52355	51557	50773	50003	49247	48503	47772	47054	46346	45651	44966	44292	43628	42974
56	53154	52342	51544	50760	49991	49234	48491	47760	47042	46335	45639	44955	44280	43617	42963
57	53141	52328	51530	50747	49978	49222	48479	47748	47030	46323	45628	44943	44269	43606	42952
58	53127	52315	51517	50734	49965	49209	48467	47736	47018	46311	45616	44932	44258	43595	42941
59	53113	52301	51504	50721	49952	49197	48454	47724	47006	46300	45605	44921	44247	43584	42931
60	53100	52288	51491	50708	49940	49184	48442	47712	46994	46288	45593	44909	44236	43573	42920

Table VI—Ternary Proportional Logarithms—(Contd.)

	67°	68°	69°	70°	71°	72°	73°	74°	75°	76°	77°	78°	79°	80°	81°
0′	42920	42276	41642	41017	40401	39794	39195	38604	38021	37446	36878	36318	35765	35218	34679
1	42909	42266	41632	41007	40391	39784	39185	38594	38011	37436	36869	36309	35755	35209	34670
2	42898	42255	41621	40997	40381	39774	39175	38585	38002	37427	36859	36299	35746	35200	34661
3	42887	42244	41611	40986	40371	39764	39165	38575	37992	37417	36850	36290	35737	35191	34652
4	42877	42234	41600	40976	40361	39754	39155	38565	37983	37408	36841	36281	35728	35182	34643
5	42866	42223	41590	40966	40350	39744	39145	38555	37973	37398	36831	36271	35719	35173	34634
6	42855	42213	41579	40955	40340	39734	39136	38545	37963	37389	36822	36262	35710	35164	34625
7	42844	42202	41569	40945	40330	39724	39126	38536	37954	37379	36812	36253	35700	35155	34616
8	42833	42191	41559	40935	40320	39714	39116	38526	37944	37370	36803	36244	35691	35146	34607
9	42823	42181	41548	40924	40310	39704	39106	38516	37934	37360	36794	36234	35682	35137	34598
10	42812	42170	41538	40914	40300	39694	39096	38506	37925	37351	36784	36225	35673	35128	34589
11	42801	42159	41527	40904	40289	39684	39086	38497	37915	37341	36775	36216	35664	35119	34581
12	42790	42149	41517	40894	40279	39674	39076	38487	37905	37332	36766	36207	35655	35110	34572
13	42780	42138	41506	40883	40269	39664	39066	38477	37896	37322	36756	36197	35646	35101	34563
14	42769	42128	41496	40873	40259	39653	39056	38467	37886	37313	36747	36188	35636	35092	34554
15	42758	42117	41485	40863	40249	39643	39046	38458	37877	37303	36737	36179	35627	35083	34545
16	42747	42106	41475	40852	40239	39633	39037	38448	37867	37294	36728	36170	35618	35074	34536
17	42737	42096	41464	40842	40228	39623	39027	38438	37857	37284	36719	36160	35609	35065	34527
18	42726	42085	41454	40832	40218	39613	39017	38428	37848	37275	36709	36151	35600	35056	34518
19	42715	42075	41443	40821	40208	39603	39007	38419	37838	37265	36700	36142	35591	35047	34509
20	42704	42064	41433	40811	40198	39593	38997	38409	37829	37256	36691	36133	35582	35038	34500
21	42693	42053	41423	40801	40188	39583	38987	38399	37819	37246	36681	36123	35573	35029	34491
22	42683	42043	41412	40791	40178	39573	38977	38389	37809	37237	36672	36114	35563	35020	34483
23	42672	42032	41402	40780	40168	39563	38968	38380	37800	37227	36663	36105	35554	35011	34474
24	42661	42022	41391	40770	40157	39553	38958	38370	37790	37218	36653	36096	35545	35002	34465
25	42651	42011	41381	40760	40147	39543	38948	38360	37781	37208	36644	36086	35536	34993	34456
26	42640	42000	41370	40749	40137	39533	38938	38351	37771	37199	36634	36077	35527	34984	34447
27	42629	41990	41360	40739	40127	39523	38928	38341	37761	37189	36625	36068	35518	34975	34438
28	42618	41979	41350	40729	40117	39513	38918	38331	37752	37180	36616	36059	35509	34966	34429
29	42608	41969	41339	40719	40107	39503	38908	38321	37742	37171	36606	36050	35500	34957	34420
30	42597	41958	41329	40708	40097	39493	38899	38312	37733	37161	36597	36040	35491	34948	34411
31	42586	41948	41318	40698	40087	39483	38889	38302	37723	37152	36588	36031	35481	34939	34403
32	42575	41937	41308	40688	40076	39473	38879	38292	37713	37142	36578	36022	35472	34930	34394
33	42565	41927	41298	40678	40066	39464	38869	38282	37704	37133	36569	36013	35463	34921	34385
34	42554	41916	41287	40667	40056	39454	38859	38273	37694	37123	36560	36003	35454	34912	34376
35	42543	41905	41277	40657	40046	39444	38849	38263	37685	37114	36550	35994	35445	34903	34367
36	42533	41895	41266	40647	40036	39434	38839	38253	37675	37104	36541	35985	35436	34894	34358
37	42522	41884	41256	40637	40026	39424	38830	38244	37665	37095	36532	35976	35427	34885	34349
38	42511	41874	41246	40626	40016	39414	38820	38234	37656	37085	36522	35967	35418	34876	34340
39	42500	41863	41235	40616	40006	39404	38810	38224	37646	37076	36513	35957	35409	34867	34332
40	42490	41853	41225	40606	39996	39394	38800	38215	37637	37067	36504	35948	35400	34858	34323
41	42479	41842	41214	40596	39985	39384	38790	38205	37627	37057	36494	35939	35391	34849	34314
42	42468	41832	41204	40585	39975	39374	38781	38195	37618	37048	36485	35930	35381	34840	34305
43	42458	41821	41194	40575	39965	39364	38771	38186	37608	37038	36476	35921	35372	34831	34296
44	42447	41811	41183	40565	39955	39354	38761	38176	37599	37029	36467	35911	35363	34822	34287
45	42436	41800	41173	40555	39945	39344	38751	38166	37589	37019	36457	35902	35354	34813	34278
46	42426	41789	41162	40544	39935	39334	38741	38156	37579	37010	36448	35893	35345	34804	34270
47	42415	41779	41152	40534	39925	39324	38731	38147	37570	37001	36439	35884	35336	34795	34261
48	42404	41768	41142	40524	39915	39314	38722	38137	37560	36991	36429	35875	35327	34786	34252
49	42394	41758	41131	40514	39905	39304	38712	38127	37551	36982	36420	35865	35318	34777	34243
50	42383	41747	41121	40503	39895	39294	38702	38118	37541	36972	36411	35856	35309	34768	34234
51	42372	41737	41111	40493	39885	39284	38692	38108	37532	36963	36401	35847	35300	34759	34225
52	42362	41726	41100	40483	39874	39274	38682	38098	37522	36953	36392	35838	35291	34750	34217
53	42351	41716	41090	40473	39864	39264	38673	38089	37513	36944	36383	35829	35282	34741	34208
54	42340	41705	41080	40463	39854	39254	38663	38079	37503	36935	36374	35820	35273	34732	34199
55	42330	41695	41069	40452	39844	39245	38653	38069	37494	36925	36364	35810	35264	34723	34190
56	42319	41684	41059	40442	39834	39235	38643	38060	37484	36916	36355	35801	35254	34715	34181
57	42308	41674	41048	40432	39824	39225	38633	38050	37474	36906	36346	35792	35245	34706	34172
58	42298	41663	41038	40422	39814	39215	38624	38040	37465	36897	36336	35783	35236	34697	34164
59	42287	41653	41028	40412	39804	39205	38614	38031	37455	36888	36327	35774	35227	34688	34155
60	42276	41642	41017	40401	39794	39195	38604	38021	37446	36878	36318	35765	35218	34679	34146

Table VI—Ternary Proportional Logarithms—(Contd.)

	82°	83°	84°	85°	86°	87°	88°	89°	90°	91°	92°	93°	94°	95°
0′	34146	33619	33099	32585	32077	31575	31079	30588	30103	29623	29148	28679	28214	27755
1	34137	33611	33091	32577	32069	31567	31071	30580	30095	29615	29141	28671	28207	27747
2	34128	33602	33082	32568	32061	31559	31063	30572	30087	29607	29133	28663	28199	27740
3	34119	33593	33073	32560	32052	31550	31054	30564	30079	29599	29125	28656	28191	27732
4	34111	33585	33065	32551	32044	31542	31046	30556	30071	29591	29117	28648	28184	27724
5	34102	33576	33056	32543	32035	31534	31038	30548	30063	29583	29109	28640	28176	27717
6	34093	33567	33048	32534	32027	31525	31030	30539	30055	29575	29101	28632	28168	27709
7	34084	33558	33039	32526	32019	31517	31021	30531	30047	29567	29093	28625	28161	27702
8	34075	33550	33030	32517	32010	31509	31013	30523	30039	29560	29086	28617	28153	27694
9	34066	33541	33022	32509	32002	31501	31005	30515	30031	29552	29078	28609	28145	27686
10	34058	33532	33013	32500	31993	31492	30997	30507	30023	29544	29070	28601	28138	27679
11	34049	33524	33005	32492	31985	31484	30989	30499	30015	29536	29062	28593	28130	27671
12	34040	33515	32996	32483	31977	31476	30980	30491	30007	29528	29054	28586	28122	27664
13	34031	33506	32987	32475	31968	31467	30972	30483	29999	29520	29046	28578	28114	27656
14	34022	33498	32979	32466	31960	31459	30964	30475	29991	29512	29038	28570	28107	27648
15	34014	33489	32970	32458	31951	31451	30956	30466	29983	29504	29031	28562	28099	27641
16	34005	33480	32962	32449	31943	31442	30948	30458	29975	29496	29023	28555	28091	27633
17	33996	33471	32953	32441	31935	31434	30939	30450	29967	29488	29015	28547	28084	27626
18	33987	33463	32944	32432	31926	31426	30931	30442	29958	29480	29007	28539	28076	27618
19	33978	33454	32936	32424	31918	31418	30923	30434	29950	29472	28999	28531	28068	27610
20	33970	33445	32927	32415	31909	31409	30915	30426	29942	29464	28991	28524	28061	27603
21	33961	33437	32919	32407	31901	31401	30907	30418	29934	29456	28984	28516	28053	27595
22	33952	33428	32910	32398	31893	31393	30898	30410	29926	29448	28976	28508	28045	27588
23	33943	33419	32902	32390	31884	31384	30890	30402	29918	29441	28968	28500	28038	27580
24	33935	33411	32893	32381	31876	31376	30882	30393	29910	29433	28960	28493	28030	27572
25	33926	33402	32884	32373	31867	31368	30874	30385	29902	29425	28952	28485	28022	27565
26	33917	33393	32876	32365	31859	31360	30866	30377	29894	29417	28944	28477	28015	27557
27	33908	33385	32867	32356	31851	31351	30857	30369	29886	29409	28937	28469	28007	27550
28	33899	33376	32859	32348	31842	31343	30849	30361	29878	29401	28929	28462	27999	27542
29	33891	33367	32850	32339	31834	31335	30841	30353	29870	29393	28921	28454	27992	27534
30	33882	33359	32842	32331	31826	31326	30833	30345	29862	29385	28913	28446	27984	27527
31	33873	33350	32833	32322	31817	31318	30825	30337	29854	29377	28905	28438	27976	27519
32	33864	33341	32824	32314	31809	31310	30817	30329	29846	29369	28897	28431	27969	27512
33	33856	33333	32816	32305	31801	31302	30808	30321	29838	29361	28890	28423	27961	27504
34	33847	33324	32807	32297	31792	31293	30800	30313	29830	29354	28882	28415	27953	27497
35	33838	33315	32799	32288	31784	31285	30792	30305	29822	29346	28874	28407	27946	27489
36	33829	33307	32790	32280	31775	31277	30784	30296	29814	29338	28866	28400	27938	27481
37	33820	33298	32782	32271	31767	31269	30776	30288	29806	29330	28858	28392	27930	27474
38	33812	33289	32773	32263	31759	31260	30768	30280	29798	29322	28851	28384	27923	27466
39	33803	33281	32765	32255	31750	31252	30759	30272	29790	29314	28843	28376	27915	27459
40	33794	33272	32756	32246	31742	31244	30751	30264	29782	29306	28835	28369	27908	27451
41	33785	33263	32747	32238	31734	31236	30743	30256	29775	29298	28827	28361	27900	27444
42	33777	33255	32739	32229	31725	31227	30735	30248	29767	29290	28819	28353	27892	27436
43	33768	33246	32730	32221	31717	31219	30727	30240	29759	29282	28811	28346	27885	27429
44	33759	33237	32722	32212	31709	31211	30719	30232	29751	29275	28804	28338	27877	27421
45	33750	33229	32713	32204	31700	31203	30710	30224	29743	29267	28796	28330	27869	27413
46	33742	33220	32705	32195	31692	31194	30702	30216	29735	29259	28788	28322	27862	27406
47	33733	33211	32696	32187	31684	31186	30694	30208	29727	29251	28780	28315	27854	27398
48	33724	33203	32688	32179	31675	31178	30686	30200	29719	29243	28772	28307	27846	27391
49	33715	33194	32679	32170	31667	31170	30678	30192	29711	29235	28765	28299	27839	27383
50	33707	33186	32671	32162	31659	31161	30670	30183	29703	29227	28757	28292	27831	27376
51	33698	33177	32662	32153	31650	31153	30662	30175	29695	29219	28749	28284	27824	27368
52	33689	33168	32654	32145	31642	31145	30653	30167	29687	29211	28741	28276	27816	27360
53	33681	33160	32645	32136	31634	31137	30645	30159	29679	29204	28733	28268	27808	27353
54	33672	33151	32636	32128	31625	31128	30637	30151	29671	29196	28726	28261	27801	27345
55	33663	33142	32628	32120	31617	31120	30629	30143	29663	29188	28718	28253	27793	27338
56	33654	33134	32619	32111	31609	31112	30621	30135	29655	29180	28710	28245	27785	27330
57	33646	33125	32611	32103	31600	31104	30613	30127	29647	29172	28702	28238	27778	27323
58	33637	33117	32602	32094	31592	31095	30605	30119	29639	29164	28695	28230	27770	27315
59	33628	33108	32594	32086	31584	31087	30596	30111	29631	29156	28687	28222	27763	27308
60	33619	33099	32585	32077	31575	31079	30588	30103	29623	29148	28679	28214	27755	27300

Table VI—Ternary Proportional Logarithms—(Contd.)

	96°	97°	98°	99°	100°	101°	102°	103°	104°	105°	106°	107°	108°	109°
0	27300	26850	26405	25964	25527	25095	24667	24244	23824	23408	22997	22589	22185	21785
1	27293	26843	26397	25956	25520	25088	24660	24237	23817	23401	22990	22582	22178	21778
2	27285	26835	26390	25949	25513	25081	24653	24229	23810	23395	22983	22575	22171	21771
3	27278	26828	26382	25942	25506	25074	24646	24222	23803	23388	22976	22569	22165	21765
4	27270	26820	26375	25934	25498	25066	24639	24215	23796	23381	22969	22562	22158	21758
5	27262	26813	26368	25927	25491	25059	24632	24208	23789	23374	22963	22555	22151	21751
6	27255	26805	26360	25920	25484	25052	24625	24201	23782	23367	22956	22548	22145	21745
7	27247	26798	26353	25913	25477	25045	24618	24194	23775	23360	22949	22542	22138	21738
8	27240	26790	26346	25905	25469	25038	24610	24187	23768	23353	22942	22535	22131	21732
9	27232	26783	26338	25898	25462	25031	24603	24180	23761	23346	22935	22528	22125	21725
10	27225	26776	26331	25891	25455	25024	24596	24173	23754	23339	22928	22521	22118	21718
11	27217	26768	26323	25883	25448	25016	24589	24166	23747	23333	22922	22515	22111	21712
12	27210	26761	26316	25876	25440	25009	24582	24159	23740	23326	22915	22508	22105	21705
13	27202	26753	26309	25869	25433	25002	24575	24152	23734	23319	22908	22501	22098	21698
14	27295	26746	26301	25861	25426	24995	24568	24145	23727	23312	22901	22494	22091	21692
15	27187	26738	26294	25854	25419	24988	24561	24138	23720	23305	22894	22488	22084	21685
16	27180	26731	26287	25847	25412	24981	24554	24131	23713	23298	22888	22481	22078	21678
17	27172	26723	26279	25840	25404	24973	24547	24124	23706	23291	22881	22474	22071	21672
18	27165	26716	26272	25832	25397	24966	24540	24117	23699	23284	22874	22467	22064	21665
19	27157	26709	26265	25825	25390	24959	24533	24110	23692	23278	22867	22461	22058	21659
20	27150	26701	26257	25818	25383	24952	24526	24103	23685	23271	22860	22454	22051	21652
21	27142	26694	26250	25810	25376	24945	24518	24096	23678	23264	22854	22447	22044	21645
22	27135	26686	26242	25803	25368	24938	24511	24089	23671	23257	22847	22440	22038	21639
23	27127	26679	26235	25796	25361	24931	24504	24082	23664	23250	22840	22434	22031	21632
24	27120	26671	26228	25789	25354	24923	24497	24075	23657	23243	22833	22427	22024	21626
25	27112	26664	26220	25781	25347	24916	24490	24068	23650	23236	22826	22420	22018	21619
26	27105	26656	26213	25774	25339	24909	24483	24061	23643	23229	22819	22413	22011	21612
27	27097	26649	26206	25767	25332	24902	24476	24054	23636	23223	22813	22407	22004	21606
28	27090	26642	26198	25759	25325	24895	24469	24047	23629	23216	22806	22400	21998	21599
29	27082	26634	26191	25752	25318	24888	24462	24040	23623	23209	22799	22393	21991	21592
30	27075	26627	26184	25745	25311	24881	24455	24033	23616	23202	22792	22386	21984	21586
31	27067	26619	26176	25738	25303	24874	24448	24026	23609	23195	22785	22380	21978	21579
32	27060	26612	26169	25730	25296	24866	24441	24019	23602	23188	22779	22373	21971	21573
33	27052	26605	26162	25723	25289	24859	24434	24012	23595	23181	22772	22366	21964	21566
34	27045	26597	26154	25716	25282	24852	24427	24005	23588	23175	22765	22359	21958	21559
35	27037	26590	26147	25709	25275	24845	24420	23998	23581	23168	22758	22353	21951	21553
36	27030	26582	26140	25701	25267	24838	24413	23991	23574	23161	22752	22346	21944	21546
37	27022	26575	26132	25694	25260	24831	24405	23984	23567	23154	22745	22339	21938	21540
38	27015	26567	26125	25687	25253	24824	24398	23977	23560	23147	22738	22333	21931	21533
39	27007	26560	26118	25680	25246	24817	24391	23970	23553	23140	22731	22326	21924	21526
40	27000	26553	26110	25672	25239	24809	24384	23963	23546	23133	22724	22319	21918	21520
41	26992	26545	26103	25665	25231	24802	24377	23956	23539	23127	22718	22312	21911	21513
42	26985	26538	26096	25658	25224	24795	24370	23949	23533	23120	22711	22306	21904	21507
43	26977	26530	26088	25650	25217	24788	24363	23942	23526	23113	22704	22299	21898	21500
44	26970	26523	26081	25643	25210	24781	24356	23935	23519	23106	22697	22292	21891	21493
45	26962	26516	26074	25636	25203	24774	24349	23928	23512	23099	22690	22286	21884	21487
46	26955	26508	26066	25629	25196	24767	24342	23921	23505	23092	22684	22279	21878	21480
47	26947	26501	26059	25621	25188	24760	24335	23914	23498	23086	22677	22272	21871	21474
48	26940	26493	26052	25614	25181	24752	24328	23908	23491	23079	22670	22265	21864	21467
49	26932	26486	26044	25607	25174	24745	24321	23901	23484	23072	22663	22259	21858	21460
50	26925	26479	26037	25600	25167	24738	24314	23894	23477	23065	22657	22252	21851	21454
51	26917	26471	26030	25592	25160	24731	24307	23887	23470	23058	22650	22245	21844	21447
52	26910	26464	26022	25585	25152	24724	24300	23880	23464	23051	22643	22239	21838	21441
53	26902	26456	26015	25578	25145	24717	24293	23873	23457	23044	22636	22232	21831	21434
54	26895	26449	26008	25571	25138	24710	24286	23866	23450	23038	22629	22225	21824	21427
55	26887	26442	26000	25563	25131	24703	24279	23859	23443	23031	22623	22218	21818	21421
56	26880	26434	25993	25556	25124	24696	24272	23852	23436	23024	22616	22212	21811	21414
57	26872	26427	25986	25549	25117	24689	24265	23845	23429	23017	22609	22205	21805	21408
58	26865	26419	25978	25542	25109	24681	24258	23838	23422	23010	22602	22198	21798	21401
59	26858	26412	25971	25534	25102	24674	24251	23831	23415	23004	22596	22192	21791	21395
60	26850	26405	25964	25527	25095	24667	24244	23824	23408	22997	22589	22185	21785	21388

Table VI—Ternary Proportional Logarithms—(Contd.)

	110°	111°	112°	113°	114°	115°	116°	117°	118°	119°	120°	121°	122°	123°
0′	21388	20995	20605	20219	19837	19457	19081	18709	18339	17973	17609	17249	16891	16537
1	21381	20988	20599	20213	19830	19451	19075	18702	18333	17966	17603	17243	16885	16531
2	21375	20982	20593	20207	19824	19445	19069	18696	18327	17960	17597	17237	16879	16525
3	21368	20975	20586	20200	19818	19439	19063	18690	18321	17954	17591	17231	16873	16519
4	21362	20969	20580	20194	19811	19432	19056	18684	18315	17948	17585	17225	16868	16513
5	21355	20962	20573	20187	19805	19426	19050	18678	18308	17942	17579	17219	16862	16507
6	21349	20956	20567	20181	19799	19420	19044	18672	18302	17936	17573	17213	16856	16501
7	21342	20949	20560	20175	19792	19413	19038	18665	18296	17930	17567	17207	16850	16496
8	21335	20943	20554	20168	19786	19407	19032	18659	18290	17924	17561	17201	16844	16490
9	21329	20936	20547	20162	19780	19401	19025	18653	18284	17918	17555	17195	16838	16484
10	21322	20930	20541	20155	19773	19395	19019	18647	18278	17912	17549	17189	16832	16478
11	21316	20923	20534	20149	19767	19388	19013	18641	18272	17906	17543	17183	16826	16472
12	21309	20917	20528	20143	19761	19382	19007	18634	18266	17900	17537	17177	16820	16466
13	21303	20910	20522	20136	19754	19376	19000	18628	18259	17894	17531	17171	16814	16460
14	21296	20904	20515	20130	19748	19369	18994	18622	18253	17887	17525	17165	16808	16454
15	21289	20897	20509	20123	19742	19363	18988	18616	18247	17881	17519	17159	16802	16449
16	21283	20891	20502	20117	19735	19357	18982	18610	18241	17875	17513	17153	16796	16443
17	21276	20884	20496	20111	19729	19351	18976	18604	18235	17869	17507	17147	16791	16437
18	21270	20878	20489	20104	19723	19344	18969	18597	18229	17863	17501	17141	16785	16431
19	21263	20871	20483	20098	19716	19338	18963	18591	18223	17857	17495	17135	16779	16425
20	21257	20865	20476	20091	19710	19332	18957	18585	18217	17851	17489	17129	16773	16419
21	21250	20858	20470	20085	19704	19325	18951	18579	18210	17845	17483	17123	16767	16413
22	21243	20852	20464	20079	19697	19319	18944	18573	18204	17839	17477	17117	16761	16407
23	21237	20845	20457	20072	19691	19313	18938	18567	18198	17833	17471	17111	16755	16402
24	21230	20839	20451	20066	19685	19307	18932	18560	18192	17827	17465	17105	16749	16396
25	21224	20832	20444	20060	19678	19300	18926	18554	18186	17821	17459	17099	16743	16390
26	21217	20826	20438	20053	19672	19294	18920	18548	18180	17815	17453	17093	16737	16384
27	21211	20819	20431	20047	19666	19288	18913	18542	18174	17809	17447	17087	16731	16378
28	21204	20813	20425	20040	19659	19282	18907	18536	18168	17803	17441	17082	16725	16372
29	21198	20806	20418	20034	19653	19275	18901	18530	18162	17797	17435	17076	16720	16366
30	21191	20800	20412	20028	19647	19269	18895	18523	18155	17790	17429	17070	16714	16361
31	21184	20793	20406	20021	19640	19263	18888	18517	18149	17784	17423	17064	16708	16355
32	21178	20787	20399	20015	19634	19257	18882	18511	18143	17778	17417	17058	16702	16349
33	21171	20780	20393	20009	19628	19250	18876	18505	18137	17772	17411	17052	16696	16343
34	21165	20774	20386	20002	19621	19244	18870	18499	18131	17766	17405	17046	16690	16337
35	21158	20767	20380	19996	19615	19238	18864	18493	18125	17760	17399	17040	16684	16331
36	21152	20761	20373	19989	19609	19231	18857	18487	18119	17754	17393	17034	16678	16325
37	21145	20754	20367	19983	19602	19225	18851	18480	18113	17748	17387	17028	16672	16320
38	21139	20748	20361	19977	19596	19219	18845	18474	18107	17742	17381	17022	16666	16314
39	21132	20741	20354	19970	19590	19213	18839	18468	18100	17736	17375	17016	16660	16308
40	21126	20735	20348	19964	19584	19206	18833	18462	18094	17730	17369	17010	16655	16302
41	21119	20728	20341	19958	19577	19200	18826	18456	18088	17724	17363	17004	16649	16296
42	21112	20722	20335	19951	19571	19194	18820	18450	18082	17718	17357	16998	16643	16290
43	21106	20715	20328	19945	19565	19188	18814	18443	18076	17712	17351	16992	16637	16284
44	21099	20709	20322	19938	19558	19181	18808	18437	18070	17706	17345	16986	16631	16279
45	21093	20702	20316	19932	19552	19175	18802	18431	18064	17700	17339	16980	16625	16273
46	21086	20696	20309	19926	19546	19169	18795	18425	18058	17694	17333	16974	16619	16267
47	21080	20690	20303	19919	19539	19163	18789	18419	18052	17688	17327	16968	16613	16261
48	21073	20683	20296	19913	19533	19156	18783	18413	18046	17682	17321	16963	16607	16255
49	21067	20677	20290	19907	19527	19150	18777	18407	18040	17676	17315	16957	16602	16249
50	21060	20670	20284	19900	19520	19144	18771	18400	18033	17669	17309	16951	16596	16243
51	21054	20664	20277	19894	19514	19138	18764	18394	18027	17663	17303	16945	16590	16238
52	21047	20657	20271	19888	19508	19131	18758	18388	18021	17657	17297	16939	16584	16232
53	21041	20651	20264	19881	19502	19125	18752	18382	18015	17651	17291	16933	16578	16226
54	21034	20644	20258	19875	19495	19119	18746	18376	18009	17645	17285	16927	16572	16220
55	21028	20638	20251	19869	19489	19113	18740	18370	18003	17639	17279	16921	16566	16214
56	21021	20631	20245	19862	19483	19106	18733	18364	17997	17633	17273	16915	16560	16208
57	21015	20625	20239	19856	19476	19100	18727	18357	17991	17627	17267	16909	16554	16203
58	21008	20618	20232	19849	19470	19094	18721	18351	17985	17621	17261	16903	16549	16197
59	21001	20612	20226	19843	19464	19088	18715	18345	17979	17615	17255	16897	16543	16191
60	20995	20605	20219	19837	19457	19081	18709	18339	17973	17609	17249	16891	16537	16185

Table VI—Ternary Proportional Logarithms—(Contd.)

	124°	125°	126°	127°	128°	129°	130°	131°	132°	133°	134°	135°	136°	137°
0'	16185	15836	15490	15147	14806	14468	14133	13800	13470	13142	12817	12494	12173	11855
1	16179	15830	15484	15141	14801	14463	14127	13795	13464	13137	12811	12489	12168	11850
2	16173	15825	15479	15135	14795	14457	14122	13789	13459	13131	12806	12483	12163	11845
3	16168	15819	15473	15130	14789	14451	14116	13784	13453	13126	12801	12478	12157	11839
4	16162	15813	15467	15124	14784	14446	14111	13778	13448	13120	12795	12472	12152	11834
5	16156	15807	15461	15118	14778	14440	14105	13773	13442	13115	12790	12467	12147	11829
6	16150	15802	15456	15113	14772	14435	14100	13767	13437	13109	12784	12462	12141	11824
7	16144	15796	15450	15107	14767	14429	14094	13761	13431	13104	12779	12456	12136	11818
8	16138	15790	15444	15101	14761	14423	14088	13756	13426	13099	12774	12451	12131	11813
9	16133	15784	15439	15096	14755	14418	14083	13750	13421	13093	12768	12446	12125	11808
10	16127	15778	15433	15090	14750	14412	14077	13745	13415	13088	12763	12440	12120	11802
11	16121	15773	15427	15084	14744	14407	14072	13739	13410	13082	12757	12435	12115	11797
12	16115	15767	15421	15079	14738	14401	14066	13734	13404	13077	12752	12430	12110	11792
13	16109	15761	15416	15073	14733	14395	14061	13728	13399	13071	12747	12424	12104	11787
14	16103	15755	15410	15067	14727	14390	14055	13723	13393	13066	12741	12419	12099	11781
15	16098	15749	15404	15061	14722	14384	14049	13717	13388	13061	12736	12414	12094	11776
16	16092	15744	15398	15056	14716	14379	14044	13712	13382	13055	12730	12408	12088	11771
17	16086	15738	15393	15050	14710	14373	14038	13706	13377	13050	12725	12403	12083	11765
18	16080	15732	15387	15044	14705	14367	14033	13701	13371	13044	12720	12397	12078	11760
19	16074	15726	15381	15039	14699	14362	14027	13695	13366	13039	12714	12392	12072	11755
20	16068	15721	15375	15033	14693	14356	14022	13690	13360	13033	12709	12387	12067	11750
21	16063	15715	15370	15027	14688	14351	14016	13684	13355	13028	12703	12381	12062	11744
22	16057	15709	15364	15022	14682	14345	14011	13679	13349	13023	12698	12376	12056	11739
23	16051	15703	15358	15016	14676	14339	14005	13673	13344	13017	12693	12371	12051	11734
24	16045	15697	15353	15010	14671	14334	14000	13668	13338	13012	12687	12365	12046	11729
25	16039	15692	15347	15005	14665	14328	13994	13662	13333	13006	12682	12360	12041	11723
26	16034	15686	15341	14999	14659	14323	13988	13657	13328	13001	12677	12355	12035	11718
27	16028	15680	15335	14993	14654	14317	13983	13651	13322	12995	12671	12349	12030	11713
28	16022	15674	15330	14988	14648	14311	13977	13646	13317	12990	12666	12344	12025	11708
29	16016	15669	15324	14982	14643	14306	13972	13640	13311	12985	12660	12339	12019	11702
30	16010	15663	15318	14976	14637	14300	13966	13635	13306	12979	12655	12333	12014	11697
31	16005	15657	15312	14971	14631	14295	13961	13629	13300	12974	12650	12328	12009	11692
32	15999	15651	15307	14965	14626	14289	13955	13624	13295	12968	12644	12323	12003	11686
33	15993	15646	15301	14959	14620	14284	13950	13618	13289	12963	12639	12317	11998	11681
34	15987	15640	15295	14954	14614	14278	13944	13613	13284	12957	12634	12312	11993	11676
35	15981	15634	15290	14948	14609	14272	13938	13607	13278	12952	12628	12307	11987	11671
36	15975	15628	15284	14942	14603	14267	13933	13602	13273	12947	12623	12301	11982	11665
37	15970	15623	15278	14937	14598	14261	13927	13596	13267	12941	12617	12296	11977	11660
38	15964	15617	15272	14931	14592	14256	13922	13591	13262	12936	12612	12291	11972	11655
39	15958	15611	15267	14925	14586	14250	13916	13585	13257	12930	12607	12285	11966	11650
40	15952	15605	15261	14919	14581	14244	13911	13580	13251	12925	12601	12280	11961	11644
41	15946	15599	15255	14914	14575	14239	13905	13574	13246	12920	12596	12275	11956	11639
42	15941	15594	15250	14908	14569	14233	13900	13569	13240	12914	12590	12269	11950	11634
43	15935	15588	15244	14902	14564	14228	13894	13563	13235	12909	12585	12264	11945	11629
44	15929	15582	15238	14897	14558	14222	13889	13558	13229	12903	12580	12259	11940	11623
45	15923	15576	15232	14891	14553	14217	13883	13552	13224	12898	12574	12253	11935	11618
46	15917	15571	15227	14886	14547	14211	13878	13547	13218	12892	12569	12248	11929	11613
47	15912	15565	15221	14880	14541	14205	13872	13541	13213	12887	12564	12243	11924	11608
48	15906	15559	15215	14874	14536	14200	13866	13536	13207	12882	12558	12237	11919	11602
49	15900	15553	15210	14869	14530	14194	13861	13530	13202	12876	12553	12232	11913	11597
50	15894	15548	15204	14863	14524	14189	13855	13525	13197	12871	12548	12227	11908	11592
51	15888	15542	15198	14857	14519	14183	13850	13519	13191	12865	12542	12221	11903	11587
52	15883	15536	15192	14852	14513	14177	13844	13514	13186	12860	12537	12216	11897	11581
53	15877	15530	15187	14846	14508	14172	13839	13508	13180	12855	12531	12211	11892	11576
54	15871	15525	15181	14840	14502	14166	13833	13503	13175	12849	12526	12205	11887	11571
55	15865	15519	15175	14835	14496	14161	13828	13497	13169	12844	12521	12200	11882	11566
56	15859	15513	15170	14829	14491	14155	13822	13492	13164	12838	12515	12195	11876	11560
57	15854	15507	15164	14823	14485	14150	13817	13486	13158	12833	12510	12189	11871	11555
58	15848	15502	15158	14818	14480	14144	13811	13481	13153	12828	12505	12184	11866	11550
59	15842	15496	15153	14812	14474	14138	13806	13475	13148	12822	12499	12179	11860	11545
60	15836	15490	15147	14806	14468	14133	13800	13470	13142	12817	12494	12173	11855	11539

Table VI—Ternary Proportional Logarithms—(Contd.)

	138°	139°	140°	141°	142°	143°	144°	145°	146°	147°	148°	149°	150°	151°
0′	11539	11226	10914	10605	10298	09994	09691	09390	09092	08796	08501	08209	07918	07630
1	11534	11221	10909	10600	10293	09989	09686	09385	09087	08791	08496	08204	07913	07625
2	11529	11215	10904	10595	10288	09984	09681	09380	09082	08786	08491	08199	07908	07620
3	11524	11210	10899	10590	10283	09978	09676	09375	09077	08781	08486	08194	07904	07615
4	11518	11205	10894	10585	10278	09973	09671	09370	09072	08776	08482	08189	07899	07610
5	11513	11200	10889	10580	10273	09968	09666	09365	09067	08771	08477	08184	07894	07606
6	11508	11195	10883	10575	10268	09963	09661	09361	09062	08766	08472	08179	07889	07601
7	11503	11189	10878	10569	10263	09958	09656	09356	09057	08761	08467	08175	07884	07596
8	11497	11184	10873	10564	10258	09953	09651	09351	09052	08756	08462	08170	07880	07591
9	11492	11179	10868	10559	10253	09948	09646	09346	09047	08751	08457	08165	07875	07586
10	11487	11174	10863	10554	10247	09943	09641	09341	09042	08746	08452	08160	07870	07582
11	11482	11169	10858	10549	10242	09938	09636	09336	09037	08741	08447	08155	07865	07577
12	11476	11163	10852	10544	10237	09933	09631	09331	09033	08736	08442	08150	07860	07572
13	11471	11158	10847	10539	10232	09928	09626	09326	09028	08732	08438	08146	07855	07567
14	11466	11153	10842	10534	10227	09923	09621	09321	09023	08727	08433	08141	07851	07562
15	11461	11148	10837	10528	10222	09918	09616	09316	09018	08722	08428	08136	07846	07558
16	11456	11143	10832	10523	10217	09913	09611	09311	09013	08717	08423	08131	07841	07553
17	11450	11137	10827	10518	10212	09908	09606	09306	09008	08712	08418	08126	07836	07548
18	11445	11132	10821	10513	10207	09903	09601	09301	09003	08707	08413	08121	07831	07543
19	11440	11127	10816	10508	10202	09898	09596	09296	08998	08702	08408	08116	07827	07539
20	11435	11122	10811	10503	10197	09893	09591	09291	08993	08697	08403	08112	07822	07534
21	11429	11117	10806	10498	10192	09887	09586	09286	08988	08692	08398	08107	07817	07529
22	11424	11111	10801	10493	10186	09882	09581	09281	08983	08687	08394	08102	07812	07524
23	11419	11106	10796	10487	10181	09877	09576	09276	08978	08682	08389	08097	07807	07519
24	11414	11101	10791	10482	10176	09872	09571	09271	08973	08678	08384	08092	07802	07515
25	11408	11096	10785	10477	10171	09867	09566	09266	08968	08673	08379	08087	07798	07510
26	11403	11091	10780	10472	10166	09862	09561	09261	08963	08668	08374	08082	07793	07505
27	11398	11085	10775	10467	10161	09857	09555	09256	08958	08663	08369	08078	07788	07500
28	11393	11080	10770	10462	10156	09852	09550	09251	08953	08658	08364	08073	07783	07496
29	11387	11075	10765	10457	10151	09847	09545	09246	08948	08653	08359	08068	07778	07491
30	11382	11070	10760	10452	10146	09842	09540	09241	08943	08648	08355	08063	07774	07486
31	11377	11065	10754	10446	10141	09837	09535	09236	08939	08643	08350	08058	07769	07481
32	11372	11059	10749	10441	10136	09832	09530	09231	08934	08638	08345	08053	07764	07476
33	11367	11054	10744	10436	10131	09827	09525	09226	08929	08633	08340	08049	07759	07472
34	11361	11049	10739	10431	10126	09822	09520	09221	08924	08628	08335	08044	07754	07467
35	11356	11044	10734	10426	10120	09817	09515	09216	08919	08624	08330	08039	07750	07462
36	11351	11039	10729	10421	10115	09812	09510	09211	08914	08619	08325	08034	07745	07457
37	11346	11034	10724	10416	10110	09807	09505	09206	08909	08614	08320	08029	07740	07453
38	11340	11028	10718	10411	10105	09802	09500	09201	08904	08609	08316	08024	07735	07448
39	11335	11023	10713	10406	10100	09797	09495	09196	08899	08604	08311	08020	07730	07443
40	11330	11018	10708	10400	10095	09792	09490	09191	08894	08599	08306	08015	07726	07438
41	11325	11013	10703	10395	10090	09787	09485	09186	08889	08594	08301	08010	07721	07433
42	11320	11008	10698	10390	10085	09782	09480	09181	08884	08589	08296	08005	07716	07429
43	11314	11002	10693	10385	10080	09777	09475	09176	08879	08584	08291	08000	07711	07424
44	11309	10997	10688	10380	10075	09772	09470	09171	08874	08579	08286	07995	07707	07419
45	11304	10992	10682	10375	10070	09766	09465	09166	08869	08575	08282	07991	07702	07414
46	11299	10987	10677	10370	10065	09761	09460	09161	08865	08570	08277	07986	07697	07410
47	11294	10982	10672	10365	10059	09756	09455	09156	08860	08565	08272	07981	07692	07405
48	11288	10977	10667	10360	10054	09751	09450	09151	08855	08560	08267	07976	07687	07400
49	11283	10971	10662	10355	10049	09746	09445	09147	08850	08555	08262	07971	07682	07395
50	11278	10966	10657	10349	10044	09741	09440	09142	08845	08550	08257	07966	07678	07391
51	11273	10961	10652	10344	10039	09736	09435	09137	08840	08545	08252	07962	07673	07386
52	11267	10956	10646	10339	10034	09731	09430	09132	08835	08540	08248	07957	07668	07381
53	11262	10951	10641	10334	10029	09726	09425	09127	08830	08535	08243	07952	07663	07376
54	11257	10945	10636	10329	10024	09721	09420	09122	08825	08530	08238	07947	07658	07371
55	11252	10940	10631	10324	10019	09716	09415	09117	08820	08526	08233	07942	07654	07367
56	11247	10935	10626	10319	10014	09711	09410	09112	08815	08521	08228	07937	07649	07362
57	11241	10930	10621	10314	10009	09706	09405	09107	08810	08516	08223	07933	07644	07357
58	11236	10925	10616	10309	10004	09701	09400	09102	08805	08511	08218	07928	07639	07352
59	11231	10920	10610	10304	09999	09696	09395	09097	08800	08506	08213	07923	07634	07348
60	11226	10914	10605	10298	09994	09691	09390	09092	08796	08501	08209	07918	07630	07343

Table VI—Ternary Proportional Logarithms—(Contd.)

	152°	153°	154°	155°	156°	157°	158°	159°	160°	161°	162°	163°	164°	165°
0′	07343	07058	06775	06494	06215	05937	05662	05388	05115	04845	04576	04308	04043	03779
1	07338	07053	06770	06489	06210	05933	05657	05383	05111	04840	04571	04304	04038	03774
2	07333	07049	06766	06485	06206	05928	05652	05378	05106	04836	04567	04300	04034	03770
3	07329	07044	06761	06480	06201	05923	05648	05374	05102	04831	04562	04295	04030	03766
4	07324	07039	06756	06475	06196	05919	05643	05369	05097	04827	04558	04291	04025	03761
5	07319	07034	06752	06471	06192	05914	05639	05365	05093	04822	04553	04286	04021	03757
6	07314	07030	06747	06466	06187	05910	05634	05360	05088	04818	04549	04282	04016	03753
7	07310	07025	06742	06461	06182	05905	05629	05356	05084	04813	04544	04277	04012	03748
8	07305	07020	06738	06457	06178	05900	05625	05351	05079	04809	04540	04273	04008	03744
9	07300	07016	06733	06452	06173	05896	05620	05347	05075	04804	04536	04269	04003	03739
10	07295	07011	06728	06447	06168	05891	05616	05342	05070	04800	04531	04264	03999	03735
11	07291	07006	06724	06443	06164	05887	05611	05337	05066	04795	04527	04260	03994	03731
12	07286	07001	06719	06438	06159	05882	05607	05333	05061	04791	04522	04255	03990	03726
13	07281	06997	06714	06433	06155	05877	05602	05328	05056	04786	04518	04251	03986	03722
14	07276	06992	06709	06429	06150	05873	05597	05324	05052	04782	04513	04246	03981	03717
15	07272	06987	06705	06424	06145	05868	05593	05319	05047	04777	04509	04242	03977	03713
16	07267	06982	06700	06419	06141	05864	05588	05315	05043	04773	04504	04237	03972	03709
17	07262	06978	06695	06415	06136	05859	05584	05310	05038	04768	04500	04233	03968	03704
18	07257	06973	06691	06410	06131	05854	05579	05306	05034	04764	04495	04229	03963	03700
19	07253	06968	06686	06405	06127	05850	05575	05301	05029	04759	04491	04224	03959	03696
20	07248	06964	06681	06401	06122	05845	05570	05297	05025	04755	04486	04220	03955	03691
21	07243	06959	06677	06396	06117	05841	05565	05292	05020	04750	04482	04215	03950	03687
22	07238	06954	06672	06391	06113	05836	05561	05288	05016	04746	04478	04211	03946	03682
23	07234	06949	06667	06387	06108	05831	05556	05283	05011	04741	04473	04206	03941	03678
24	07229	06945	06663	06382	06104	05827	05552	05278	05007	04737	04469	04202	03937	03674
25	07224	06940	06658	06377	06099	05822	05547	05274	05002	04732	04464	04198	03933	03669
26	07219	06935	06653	06373	06094	05818	05543	05269	04998	04728	04460	04193	03928	03665
27	07215	06931	06648	06368	06090	05813	05538	05265	04993	04723	04455	04189	03924	03661
28	07210	06926	06644	06364	06085	05808	05533	05260	04989	04719	04451	04184	03919	03656
29	07205	06921	06639	06359	06080	05804	05529	05256	04984	04714	04446	04180	03915	03652
30	07200	06916	06634	06354	06076	05799	05524	05251	04980	04710	04442	04175	03911	03647
31	07196	06912	06630	06350	06071	05795	05520	05247	04975	04706	04437	04171	03906	03643
32	07191	06907	06625	06345	06067	05790	05515	05242	04971	04701	04433	04167	03902	03639
33	07186	06902	06620	06340	06062	05785	05511	05238	04966	04697	04429	04162	03897	03634
34	07181	06898	06616	06336	06057	05781	05506	05233	04962	04692	04424	04158	03893	03630
35	07177	06893	06611	06331	06053	05776	05501	05228	04957	04688	04420	04153	03889	03626
36	07172	06888	06606	06326	06048	05772	05497	05224	04953	04683	04415	04149	03884	03621
37	07167	06883	06602	06322	06043	05767	05492	05219	04948	04679	04411	04144	03880	03617
38	07162	06879	06597	06317	06039	05762	05488	05215	04944	04674	04406	04140	03875	03612
39	07158	06874	06592	06312	06034	05758	05483	05210	04939	04670	04402	04136	03871	03608
40	07153	06869	06588	06308	06030	05753	05479	05206	04935	04665	04397	04131	03867	03604
41	07148	06865	06583	06303	06025	05749	05474	05201	04930	04661	04393	04127	03862	03599
42	07143	06860	06578	06298	06020	05744	05470	05197	04926	04656	04388	04122	03858	03595
43	07139	06855	06574	06294	06016	05739	05465	05192	04921	04652	04384	04118	03853	03591
44	07134	06850	06569	06289	06011	05735	05460	05188	04917	04647	04380	04114	03849	03586
45	07129	06846	06564	06284	06006	05730	05456	05183	04912	04643	04375	04109	03845	03582
46	07124	06841	06560	06280	06002	05726	05451	05179	04908	04638	04371	04105	03840	03578
47	07120	06836	06555	06275	05997	05721	05447	05174	04903	04634	04366	04100	03836	03573
48	07115	06832	06550	06271	05993	05717	05442	05170	04899	04629	04362	04096	03832	03569
49	07110	06827	06545	06266	05988	05712	05438	05165	04894	04625	04357	04091	03827	03564
50	07105	06822	06541	06261	05983	05707	05433	05161	04890	04620	04353	04087	03823	03560
51	07101	06817	06536	06257	05979	05703	05429	05156	04885	04616	04348	04083	03818	03556
52	07096	06813	06531	06252	05974	05698	05424	05151	04881	04612	04344	04078	03814	03551
53	07091	06808	06527	06247	05970	05694	05419	05147	04876	04607	04340	04074	03810	03547
54	07087	06803	06522	06243	05965	05689	05415	05142	04872	04603	04335	04069	03805	03543
55	07082	06799	06517	06238	05960	05684	05410	05138	04867	04598	04331	04065	03801	03538
56	07077	06794	06513	06233	05956	05680	05406	05133	04863	04594	04326	04061	03796	03534
57	07072	06789	06508	06229	05951	05675	05401	05129	04858	04589	04322	04056	03792	03530
85	07068	06785	06503	06224	05947	05671	05397	05124	04854	04585	04317	04052	03788	03525
59	07063	06780	06499	06219	05942	05666	05392	05120	04849	04580	04313	04047	03783	03521
60	07058	06775	06494	06215	05937	05662	05388	05115	04845	04576	04308	04043	03779	03516

Table VI—Ternary Proportional Logarithms—(Contd.)

	166°	167°	168°	169°	170°	171°	172°	173°	174°	175°	176°	177°	178°	179°
0′	03516	03256	02996	02739	02482	02228	01974	01723	01472	01223	00976	00730	00485	00242
1	03512	03251	02992	02734	02478	02223	01970	01718	01468	01219	00972	00726	00481	00238
2	03508	03247	02988	02730	02474	02219	01966	01714	01464	01215	00968	00722	00477	00234
3	03503	03243	02983	02726	02470	02215	01962	01710	01460	01211	00964	00718	00473	00230
4	03499	03238	02979	02721	02465	02211	01958	01706	01456	01207	00960	00714	00469	00226
5	03495	03234	02975	02717	02461	02206	01953	01702	01452	01203	00955	00709	00465	00222
6	03490	03230	02970	02713	02457	02202	01949	01698	01447	01199	00951	00705	00461	00218
7	03486	03225	02966	02709	02453	02198	01945	01693	01443	01195	00947	00701	00457	00214
8	03482	03221	02962	02704	02448	02194	01941	01689	01439	01190	00943	00697	00453	00210
9	03477	03217	02958	02700	02444	02190	01937	01685	01435	01186	00939	00693	00449	00206
10	03473	03212	02953	02696	02440	02185	01932	01681	01431	01182	00935	00689	00445	00202
11	03469	03208	02949	02692	02436	02181	01928	01677	01427	01178	00931	00685	00441	00197
12	03464	03204	02945	02687	02431	02177	01924	01672	01422	01174	00927	00681	00436	00193
13	03460	03199	02940	02683	02427	02173	01920	01668	01418	01170	00923	00677	00432	00189
14	03455	03195	02936	02679	02423	02168	01916	01664	01414	01166	00918	00673	00428	00185
15	03451	03191	02932	02674	02419	02164	01911	01660	01410	01161	00914	00669	00424	00181
16	03447	03186	02927	02670	02414	02160	01907	01656	01406	01157	00910	00665	00420	00177
17	03442	03182	02923	02666	02410	02156	01903	01652	01402	01153	00906	00660	00416	00173
18	03438	03178	02919	02662	02406	02152	01899	01647	01398	01149	00902	00656	00412	00169
19	03434	03173	02915	02657	02402	02147	01895	01643	01393	01145	00898	00652	00408	00165
20	03429	03169	02910	02653	02397	02143	01890	01639	01389	01141	00894	00648	00404	00161
21	03425	03165	02906	02649	02393	02139	01886	01635	01385	01137	00890	00644	00400	00157
22	03421	03160	02902	02644	02389	02135	01882	01631	01381	01133	00886	00640	00396	00153
23	03416	03156	02897	02640	02385	02130	01878	01627	01377	01128	00881	00636	00392	00149
24	03412	03152	02893	02636	02380	02126	01874	01622	01373	01124	00877	00632	00388	00145
25	03408	03147	02889	02632	02376	02122	01869	01618	01368	01120	00873	00628	00384	00141
26	03403	03143	02884	02627	02372	02118	01865	01614	01364	01116	00869	00624	00380	00137
27	03399	03139	02880	02623	02368	02114	01861	01610	01360	01112	00865	00620	00376	00133
28	03395	03134	02876	02619	02363	02109	01857	01606	01356	01108	00861	00616	00372	00129
29	03390	03130	02872	02615	02359	02105	01853	01601	01352	01104	00857	00611	00367	00125
30	03386	03126	02867	02610	02355	02101	01848	01597	01348	01100	00853	00607	00363	00121
31	03381	03121	02863	02606	02351	02097	01844	01593	01344	01095	00849	00603	00359	00117
32	03377	03117	02859	02602	02346	02092	01840	01589	01339	01091	00845	00599	00355	00113
33	03373	03113	02854	02597	02342	02088	01836	01585	01335	01087	00840	00595	00351	00109
34	03368	03108	02850	02593	02338	02084	01832	01581	01331	01083	00836	00591	00347	00105
35	03364	03104	02846	02589	02334	02080	01827	01576	01327	01079	00832	00587	00343	00101
36	03360	03100	02841	02585	02329	02076	01823	01572	01323	01075	00828	00583	00339	00097
37	03355	03096	02837	02580	02325	02071	01819	01568	01319	01071	00824	00579	00335	00093
38	03351	03091	02833	02576	02321	02067	01815	01564	01315	01067	00820	00575	00331	00089
39	03347	03087	02829	02572	02317	02063	01811	01560	01310	01062	00816	00571	00327	00085
40	03342	03083	02824	02568	02312	02059	01806	01556	01306	01058	00812	00567	00323	00080
41	03338	03078	02820	02563	02308	02054	01802	01551	01302	01054	00808	00563	00319	00076
42	03334	03074	02816	02559	02304	02050	01798	01547	01298	01050	00804	00559	00315	00072
43	03329	03070	02811	02555	02300	02046	01794	01543	01294	01046	00799	00554	00311	00068
44	03325	03065	02807	02551	02295	02042	01790	01539	01290	01042	00795	00550	00307	00064
45	03321	03061	02803	02546	02291	02038	01785	01535	01286	01038	00791	00546	00303	00060
46	03316	03057	02799	02542	02287	02033	01781	01531	01281	01034	00787	00542	00299	00056
47	03312	03052	02794	02538	02283	02029	01777	01526	01277	01029	00783	00538	00295	00052
48	03308	03048	02790	02533	02278	02025	01773	01522	01273	01025	00779	00534	00290	00048
49	03303	03044	02786	02529	02274	02021	01769	01518	01269	01021	00775	00530	00286	00044
50	03299	03039	02781	02525	02270	02017	01764	01514	01265	01017	00771	00526	00282	00040
51	03295	03035	02777	02521	02266	02012	01760	01510	01261	01013	00767	00522	00278	00036
52	03290	03031	02773	02516	02262	02008	01756	01506	01257	01009	00763	00518	00274	00032
53	03286	03026	02769	02512	02257	02004	01752	01501	01252	01005	00759	00514	00270	00028
54	03282	03022	02764	02508	02253	02000	01748	01497	01248	01001	00754	00510	00266	00024
55	03277	03018	02760	02504	02249	01995	01744	01493	01244	00997	00750	00506	00262	00020
56	03273	03014	02756	02499	02245	01991	01739	01489	01240	00992	00746	00502	00258	00016
57	03269	03009	02751	02495	02240	01987	01735	01485	01236	00988	00742	00497	00254	00012
58	03264	03005	02747	02491	02236	01983	01731	01481	01232	00984	00738	00493	00250	00008
59	03260	03001	02743	02487	02232	01979	01727	01476	01228	00980	00734	00489	00246	00004
60	03256	02996	02739	02482	02228	01974	01723	01472	01223	00976	00730	00485	00242	00000

ERRATA

	FOR	READ
Page 37 Line 11 and 12,	"The definition—admits of"	"There are"
Page 46	"Exercise 32, 33, 34, 35, 36, 37, 38"	"Exercise 42, 43, 44, 45, 46, 47, 48"
Page 52	"Exercise 39"	"Exercise 49"
Page 53	"Exercise 40, 41"	"Exercise 50, 51"
Page 66	"Exercise 42, 43, 44, 45, 46, 47, 48, 49"	"Exercise 52, 53, 54, 55, 56, 57, 58, 59"
Page 72 Insert here	"Exercise 60" (see page 160)	
Page 97	"Article 74"	"Article 75"
Page 98	"Article 75"	"Article 76"
Page 99	"Radical"	"Radix"
" "	"Article 76"	"Article 77"
Page 100	"Article 77, 78"	"Article 78, 79"
Page 101	"Article 79"	"Article 80"
Page 103	"Article 80"	"Article 81"
Page 108	"Article 81"	"Article 82"
Page 109	"Article 82, 83"	"Article 83, 84"
Page 112	"Article 84,"	"Article 85"
Page 118 Line 1, Delete	"for the twenty-ninth year"	

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N.B.—The figures refer to pages.

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