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OR THE

COMPLETE ARCANA

OF

ASTRO PHILOSOPHY:

COMMENCING WITH

GENETHLIOLOGY SIMPLIFIED,

OR THE

PHILOSOPHY OF THE DOCTRINE OF

NATIVITIES.

ALSO

THE ASTRO METEOROLOGIST.

By W. J. SIMMONITE, A.M., M.B.A., PH. MAT.

THIRD YEAR'S IMPRESSION.

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No. 11 will be Published on the 1st of July, 1846.

CONTENTS OF THE ARCANA.

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PROBLEMS.


BRITISH MUSEUM

THE

ARCANA

OF

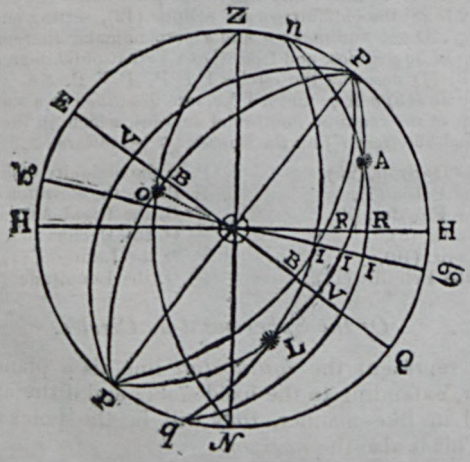
PRACTICAL ASTRAL PHILOSOPHY.

BOOK THE SECOND.

ON THE DOCTRINE OF THE SPHERE AND ASTRO-MATHEMATICS.

1. By the *Doctrine of the Sphere* is meant the Solution of such Problems as relate to the Heavens, or Concavity of the visible World: in measuring the Circles thereof, the Angles they make with each other, I shall shew in a method more concise and methodical than any other. I here combine Spherical Geometry, Spherical Trigonometry, Astronomical Problems, and the use of Logarithms, which are inseparably connected therewith.

2. A *sphere*, commonly called a *globe*, is a round body, having every point on its surface equal distance from a point within, called the *centre*.



3. If, on a clear night, you place yourself in a situation, in which the view of the horizon is uninterrupted, and attentively observe the

heavens, you will see the stars, as fixed in a concave spherical surface, which surface is every where bespangled with an innumerable multitude of shining stars, which are continually changing their places.

Some stars rise above the horizon towards the east, some disappear towards the west, and others never reach the horizon, all these performing their motions, whilst their relative positions remain the same.

There are various methods of the construction of the sphere, but the most simple, and most generally employed, is the *stereographic*, in which all the circles of the sphere, are represented by straight lines or circles. Suppose a transparent globe, on whose surface is the representation of the heavens, and the eye placed in any part of that surface viewing the opposite side, the lines should then appear as is represented by this projection.

4. To project an object *of the sphere in plano*, is a true geometrical delineation of the circles of the sphere, or any assigned part of them upon the plane of some one great circle, as on the horizon, *meridian*, equinoctial, ecliptic, colours, or on the tropic, &c., and we delineate this Stereographic Projection, which supposes the eye to be but 90 degrees distant from, and perpendicular to the plane of the projection. That plane, upon which the object is projected or delineated, is called the *plane of projection*, or *primitive*; and the point in which the eye is situated, is called the *projecting point*, or the *point of sight*.

To project the Sphere Stereographically upon the Plane of the Meridian.

5. The foregoing stereographic projection of the sphere is that in which a great circle is assused as the *plane of the projection*, and the opposite equinox as the projecting point.

CONSTRUCTION—With the chord of 60 degrees describe the circle H, Z, H, N, and draw the diameter H, H, and Z, N, at right angles to each other; then will H, H, represent the equator, and Z, N, the polar axis. Lay off from the same line of chords 23° 28′ the obliquity of the ecliptic (12), setting one foot of the compass upon E ♈, Q ♎, and make *n* and *q* perpendicular thereto. From ⊕ to B lay the tangent of 30 degrees, and from ⊕ to V that of 60 degrees, through which points P and P, (7) describe the circles P B P, P V P, &c. The meridians of celestial longitude (15) *n* A *q*, and *n* I * *q*, are described in a similar manner, laying the tangent of the required number of degrees, which, in the foregoing projection, are 45° and 75° from ⊕ on the line ♎ ⊕ ♈ towards ♎.

H H are the Horizon, (25),
P. P. are the Poles, (7),
E. Q. are the Equator, (8),
Z. is the Zenith, (9),
N. is the Nadir, (10),
♎. ♈ are the Ecliptic, (11).

P. *n*. the obliquity of Ecliptic, (12),
H. P. are the elevation of the Poles, (13),
⊕ B. the Right Ascension, (15),
⊕ O. the Declination, (16),
P. ✻ the Latitude, (17),
⊕ O. the Longitude, (15).

Of the Sphere and its Circles.

6. H. H. represent the *equinoctial* line, is a plane of the terrestrial equator, extending to the fixed stars; and if the axis of the earth be produced in like manner, they will be the poles of the celestial equator. This is also the *horizon*.

7. P. P. the *poles* of a sphere, are the extremities of the axis; as, P. P. are the poles of the circle P. B. P. The poles of great circles are each 90 degrees from the circumference of the circles. In the

figure (2) the arcs P. V. P., P. B. P., between the great circle and its pole, P., are arcs of 90 degrees.

8. E. Q. *equator*, a great circle which separates the northern from the southern hemisphere.

9. Z. the *zenith*, which is the summit of the celestial dome above us, or perpendicularly over our heads, 90 degrees from the horizon, the pole of the horizon. The prime vertical passing through 0 deg. of Aries. The sun arrives here about mid-day, or noon. This is also *Medium Cœli*, or *Mid-heaven*, that degree of the ecliptic which is upon the meridian at any time of our day; also called *Upper Meridian*.

10. N. the *nadir*, (an Arabic term) is the point of the heavens directly under the feet of the observer, and diametrically opposite to the zenith. The sun arrives here at mid-night. This point is also called the *Imum cœli*, or *under-heaven;* being the *cusp* of the *fourth house*.

11. ♋. ♑. the *ecliptic*. The apparent great circle in the heavens, in which the sun appears to move in the course of the year, *n* shews its north pole, and *q* its south pole. It intersects the equator into two points, called the *vernal* and *autumnal* equinoxes; because, when the sun is in these points, the days and nights are equal all over the earth. It is called the ecliptic, because all the *eclipses* of the *luminaries* must necessarily happen in this line, (22).

12. P. *n*. the *obliquity of the ecliptic*. The ecliptic and equator, being great circles, must bisect or equally divide each other; and their inclination, or *difference*, is called the obliquity of the ecliptic; or the sun's *greatest declination*.

13. H. P. *elevation* of the pole or star is its height, in degrees, between the pole and the horizon, or equal to the latitude of the place at birth, or country, observatory, &c.

14. P V P, P O P, P A L *q*, are *meridians* of terrestrial longitude which are the halves of great circles drawn round the earth through its poles and passing the latitude of any place in its meridian. Longitude, on the earth, is the distance of any place east or west of Greenwich, according to *British computation*.

15. *n*. A. I. *q*.—*n*. I. *. *q*., &c., are *meridians* of *celestial* longitude, and is the distance of any heavenly body from first point of the zodiacal sign Aries, 0° 0, measured on the ecliptic. The longitude and Right Ascension are measured in this direction. In the right angled triangle ⊕. B. O., the line ⊕. O. is the sun's longitude, or an arc of the ecliptic, from the first point of Aries. ⊕. B. the sun's Right Ascension, or an arc of the equator, from the first point of Aries, (20).

16. ⊕. O. on the ecliptic, in the right angled triangle, is the sun's declination, and the angle B. ⊕. O., is the obliquity of the ecliptic, measured by the arc Q. ♋., E. ♑.

N. B. When the sun, or any other heavenly body, is in that part of the ecliptic which is Q. ♋. towards the north pole, the declination is called *north*, and when in that part which is E. ♑. towards the south pole, the declination is *south*.

17. P. *. represent the circle of latitude, *n*. A. the complement of the star's latitude, I. A. when the star is on the north side of the ecliptic, it is called *north* latitude; but if on the southern side, then it is called *south* latitude. P. A. the complement of the star's declination B. A.

8. The angle P. *n*. A., the complement of the star's longitude. The supplement of the angle *n*. P. A., measured by the arc V. Q., equals the complement of the *star's right ascension*. (151)

All spheres are divided into two, *great* and *small* circles.

19. A *great circle* of a sphere is a circle drawn upon its surface, whose plane passes through the ⊕ centre of the sphere; as, P B P., Z O N, are great circles. Every section of a sphere is a circle. A *small* circle of a sphere is a circle drawn upon its surface, whose plane does not cut the centre of the sphere. Two *great circles* of the sphere crossing each other, into two equal parts or semicircles; as, both the great circles P ⊕ P, Z O N, divide each other into two equal parts or semicircles.

20. A great circle passing through the sun and the poles, will intersect the equator in a point which represents the place of the sun referred to the equator. The arc of the equator intercepted between this point and the vernal equinox, is called the *sun's right ascension* (15). The arc of the ecliptic intercepted between the sun and the same equinox, is denominated the *sun's longitude*. And the arc of the great circle intercepted between the sun and its place referred to the equator, is called the *sun's declination*.

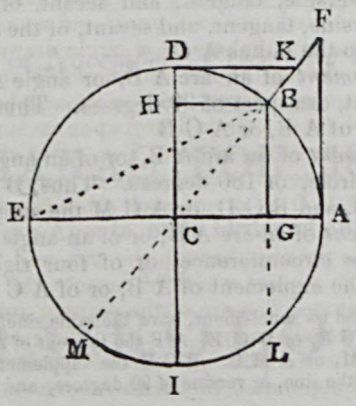
21. The *tropics* are two small circles, parallel to the equator, at 23 degrees 28 minutes distance from the equator; that to the north is called the tropic of Cancer, and where the sun reaches in declination about the longest day; and that to the south, the tropic of Capricorn, where the sun arrives about the shortest day.

22. *Solstitial points* are the first point of ♋, and the first point of ♑, being the most extreme north and south points in the ecliptic. At these points, the sun seems to stand still, or be at the same height in the heavens, at noon, for several days together (11). The extent of the *obliquity* of *ecliptic*.

23. The *axis* is the diameter about which it rotates, which does not shift its position, while the other parts describe circles around it.

24. *Azimuth*, or vertical circles, are great circles of the sphere passing through the zenith and nadir, and are perdendicular to the horizon. Let a person stand at ⊕, and let H. H. be his horizon, then the circle Z. O. N. is a vertical or azimuth circle. *Azimuth* of any celestial object is an arc of the horizon, contained between the east and west point of the heavens, and a vertical circle passing through the centre of that object. (2).

25. The *horizon*, is a great circle (19) perpendicular to the vertical, or 90 degrees distant from the nadir and zenith, thus dividing the world into two equal parts, or hemispheres: it is the diameter of the sphere, as H H. The eastern, or left hand H, is the *ascendant*, or 1st house; the western H is the *descendant*, or 7th house, (9 & 10).



26. A *circle* is a plane figure, bounded by one line, called the circumference, every point of which is equally distant from a certain point within the figure, called its centre.

In the figure, C is the centre, E D A I is the circumference, which is sometimes called the periphery.

27. The *diameter* of a *circle* is a line drawn through the centre, and terminated at both ends by the circumference; as, A E is a diameter.

28. Every diameter is double the radius, and divides the circle into two equal parts. The terminating points of the diameter are sometimes called its poles; as, D and I.

29. The *radius* of a circle is a line drawn from the centre C to the circumference; as, C A: also E C and D C are called radii.

30. A *semicircle* is a segment cut off by the diameter, or half the area of the circle, and contains 180 degrees; as, I D A.

31. A *chord* of a circle is a straight line joining the two extremities of an arc; as, B G L, thus cutting the circle into two unequal parts.

32. A *quadrant* is the half of a semicircle, or quarter of the whole circle, consisting of 90 degrees; as, E D C.

33. All circles, great or small, are divided into 360 equal parts, called *degrees;* each degree into 60 *minutes;* each minute into 60 *seconds*, and so on. The degrees may be great or small, according to the size of the circle.

34. An *arc* of a circle is any part of the circumference.

35. A *segment* of a circle is the arc cut off by a straight line; as, B A L is a segment.

36. A *tangent* to a circle is a straight line, which touches the circle, and, on being continued, does not cut it; as, A F is a tangent.

37. The *sine* B G of an arc A B, is a straight line drawn from B, one of its extremities, perpendicular to the diameter A E, which passes through the other.

38. The *versine* A G of an arc A B is that portion of the diameter A E upon which the sine is perpendicularly intercepted between the sine and the arc.

39. The *secant* C F of an arc A B is a straight line drawn from C, the centre, to F the farthest extremity of the tangent.

40. The sine, versine, tangent, and secant, of an arc A B, are called the sine, versine, tangent, and secant, of the angle A C B, measured by the arc, to the radius A C.

41. The *complement* of an arc A B, or angle A B C, is what it wants of a quadrant, or aspect of 90 degrees. Thus, B D, or B C D, is the complement of A B, or A C B.

42. The *supplement* of an arc A B, or of an angle A C B, is what it wants of a semicircle, or 180 degrees. Thus, B E, or A M, is the supplement of A B, and B C D, or A C M the supplement of A C B.

43. The *explement* of an arc A B, or of an angle A C B, is what it wants of the whole circumference, or of four right angles. Thus, B D E M L A is the explement of A B, or of A C B.

An arc, or angle, and its supplement, have the same sine, tangent, and secant, for B G is the sine of B E, or B C E, A F the tangent of A M, or A C M, and C F the secant of A M, or A M C. B C E the supplement to two right angles. The radius is equal to the sine, or versine of 90 degrees, and to the tangent, or cotangent of 45 degrees.

Observation.

I have considered it would be better and more expeditious to commence calculations with a perspicuous *Elementary Series* of Practical Problems in Genethliological Mathematics, easy to be understood even by the merest tyro in Arithmetic: after which I intend entering more minutely into the Mathematical Treatises of Spherical Geometry, Spherical Trigonometry, and Astronomical Problems, illustrating by diagrams, the *Anatomy of the Sphere*. By these means the philosophy of Aspects, and the natural divisions of the Heavens will be fully demonstrated.

Instructions in erecting an Horoscope of the Heavens, for any latitude, at any moment of time.

Problem I.

44. To find the Geocentric Longitude of the Sun or planets, at any given moment of time.

Rule 1st. Find the amount of Longitude in the Zodiac traversed by each planet, or other heavenly bodies, between the noon *preceding* and that which *follows* the given time or moment at birth. 2nd. Then say, if 24 hours give that amount, what will that time for which the figure is intended, from the preceding noon give? 3rd. Add the result to the planet's longitude at the preceding noon, and the amount is its true place.

Note. If the planet be *retrograde*, then SUBTRACT the result from the planet's place from the preceding noon.

G. Thorpe, Printer, Thorne.