# THE PLANETARY DISTANCES

Published @ 2017 Trieste Publishing Pty Ltd

ISBN 9780649258895

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Edited by Trieste Publishing Pty Ltd.
Cover @ 2017



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BY

LAURENCE M'CURRICK.

(AUTHOR OF PAPERS ON ELEMENTARY EDUCATION, ETC.)

"Knowest thou the ordinances of heaven?
Canst thou set the dominion thereof in the earth?"
—JOB xxxviii., 33.

PRINTED BY WILLIAM COLLINS, SONS, & CO., LIMITED.
1883.

# PREFACE.

THE theories propounded in the following pages are in every sense *revolutionary*, and therefore cannot be expected to gain the ascendancy without a struggle. Respecting the superincumbent theory of the Planetary Distances, the uniqueness of the system here unfolded, the variety of methods bringing out the same results, and the great number of remarkable coincidences which cannot reasonably be regarded as accidental, are strong presumptions in its favour.

New light is thrown on the relationship of the circle and square, the sphere and cube; and the progression 1, 3, 9, 27, is found to be their great common highway; a system of Celestial Arithmetic is sketched, showing and comparing the circulates and ratios of circle, square, and number; Bode's Law is shown to be founded on fact, and by its aid the complement or counterpart of Kepler's Third Law is found; the force of factors, both geometrical and numerical, is proved to be the same law of nature as the gravitation of matter; the inverse ratio of the square of the distance is accounted for, and a more benign theory of Solar Influence is put forth.

While the cry is still for more light, this essay may in some measure tend to promote the spread of truth and the increase of knowledge.

# THE PLANETARY DISTANCES.

## CHAPTER I.

### THE GEOMETRICAL CONSTRUCTION OF THE SOLAR SYSTEM.

#### Method I. (Fig. 1.)

ABOUT the square $m\,n\,o\,p$ circumscribe a circle. S is the centre of the circumscribed circle. Draw the diameter $q\,a$ parallel to $p\,m$, and cutting $m\,n$ in $r$. Produce $q\,a$ to $x$, and bisect $r\,a$ in $v$. The radius S $a$ is taken as the distance of Mercury from the Sun. From $a\,x$ cut off $a\,b$ equal to S $v$, and $a\,c$ equal to arc of quadrant $n\,a\,m$. S $b$ is the distance of Venus from the Sun, and S $c$, that of the Earth. From $c\,x$ cut off $c\,d$ equal to arc of quadrant $t\,v\,y$. S $d$ is the distance of Mars. The quadrant is now exhausted. From $d\,x$ cut off $d\,e$ equal to semi-circumference $a\,m\,p\,q$. S $e$ is the average distance of the Asteroids. From $e\,x$ cut off $e\,f$ equal to circumference $a\,m\,q\,n$. S $f$ is the distance of Jupiter. The first circle is now exhausted. The progression is by circles, the radius of each being respectively the 1st, 4th, 7th distance, the difference being 3. From S $x$ cut off S $g$ equal to the circumference of the second circle, whose radius is S $d$. S $g$ is the distance of Saturn. The second circle is exhausted at once. Proceed now to the third circle, whose radius is S $g$. From S $x$ cut off S $h$ equal to the diameter. S $h$ is the distance of Uranus. From S $x$ cut off S $k$ equal to the semi-circumference. S $k$ is the distance of Neptune. From S $x$ cut off S $l$ equal to the circumference. S $l$ is the distance of the undiscovered planet.

Construct a scale so that S*c* (the Earth) = 1.

| | | | Present Mean Distances. |
|---|---|---|---|
| Mercury, S*a* | $= \frac{1}{\frac{1+3{\cdot}1416}{2}}$ | = ·389 | ·387099 |
| Venus, S*b* | = ·389 + ·332 | = ·721 | ·723332 |
| Earth, S*c* | = | 1·000 | 1·000000 |
| Mars, S*d* | $= 1+\left({\cdot}332 \times \frac{3{\cdot}1416}{2}\right)$ | = 1·5215 | 1·523691 |
| Asteroids, S*e* | = 1·5215 + (·389 × 3·1416) | = 2·7437 | |
| Jupiter, S*f* | = 2·7437 + (·389 × 3·1416 × 2) | = 5·1877 | 5·202798 |
| Saturn, S*g* | = 1·5215 × 3·1416 × 2 | = 9·5598 | 9·538852 |
| Uranus, S*h* | = 9·5598 × 2 | = 19·1196 | 19·182639 |
| Neptune, S*k* | = 9·5598 × 3·1416 | = 30·0331 | 30·036970 |
| Undiscovered, S*l* | = 9·5598 × 3·1416 × 2 | = 60·0662 | |

## Method II. (Fig. 2.)

By the first method the relative distances are not affected by the particular unit of measure; but by the second method the unit of measure must be the first distance (Mercury) divided by 3·9. This number must be supposed to belong to the Problem by this method of solution, and will be accounted for in a subsequent chapter. The Inner Circle in fig. 2 is divided proportionally, the extremes being the radius and the circumference, and the means being such as to make the sum of the first three proportionals as nearly as possible equal to the fourth; thus—

Rad. $(a) : b :: b : \frac{b^2}{a}$ Rad. $: b :: \frac{b^2}{a}$ : Circumference

3·9 : 7·2 :: 7·2 : 13·3. 3·9 : 7·2 :: 13·3 : 24·5.

Proportionals of Inner Circle, 3·9 : 7·2 :: 13·3 : 24·5.

Difference between, 3·3 6·1 11·2.

Proportionals of Middle Circle, $d : e :: f : g$ = 15·2 : 28 :: 51·9 : 95·6.

Proportionals of Outer Circle, Rad. : Diam. :: Semicir. : Circumf. = 95·6 : 191·2 :: 300 : 600. Rad. = 4th Prop. of Middle Circle. Diam. = Sum of Middle Circle.

### Progression of Distances.

| | | | |
|---|---|---|---|
| 1. Radius, 3·9 | = Mercury | = 3·9 | Inner Circle. |
| 2. Rad. + 1st. Dif. 3·9 + 3·3 | = Venus | = 7·2 | |
| 3. Rad. + 2nd Dif. 3·9 + 6·1 | = Earth | = 10· | |
| 4. Rad. + 3rd Dif. 3·9 + 11·2 | = Mars | = 15·1 | |

Or,

| | | | |
|---|---|---|---|
| 4. Rad. × 1st Prop. 3·9 × 3·9 = Mars | = 15·21 | } | Middle Circle. |
| 5. Rad. × 2nd Prop. 3·9 × 7·2 = Asteroids | = 28·08 | | |
| 6. Rad. × 3rd Prop. 3·9 × 13·3 = Jupiter | = 51·87 | | |
| 7. Rad. × 4th Prop. 3·9 × 24·5 = Saturn | = 95·55 | | |

Or,

| | | | |
|---|---|---|---|
| 7. Circumf. × Rad. 24·5 × 3·9 = Saturn | = 95·55 | } | Outer Circle. |
| 8. Circumf. × Diam. 24·5 × 7·8 = Uranus | = 191·1 | | |
| 9. Circumf. × Semicir. 24·5 × 12·25 = Neptune | = 300·125 | | |
| 10. Circumf. × Circumf. 24·5 × 24·5 = Undisc. | = 600·125 | | |

While the last distance in the beautiful arrangement here disclosed evidently ends the Planetary System, it is by no means so clear that the first begins it. During a total eclipse of the sun on 6th May this year (1883) efforts were to be made to ascertain if there are intra-Mercurial planets. We may here anticipate what will be shown in a subsequent chapter so far as to state that if there are such planets, they are two in number, the second (S *r*, fig. 1) being twice the distance from the Sun that the first is, and Mercury, the third (*c*), bearing the following relation to them:

$$a : b :: b^2 : c^3 ; \text{ or, } a : 2a :: 4a^2 : c^3.$$

There is thus reason to hope that our theory may be tested by actual observation.

### Progression of Circles – Difference = 3.

| Distance. | |
|---|---|
| 1. | 1st Radius = 3·9 = 1st Proportional. |
| 4. | 2nd Radius × 3·9 = Cube of 1st Prop. |
| 7. | 3rd Radius × 3·9 = Cube of 2nd Prop. |
| 10. | 4th Radius × 3·9 = Cube of 3rd Prop. |

The cube of the 4th Proportional remains to be accounted for. Since, by the theory, the tenth distance is the last, the orbit of the undiscovered planet, multiplied by 3·9, is the cube of the 4th Proportional.

Regarding these circles as the circumference of spheres, the Planetary System, enclosed as in its shell, is thus completed.

## CHAPTER II.

### PHYSICAL CAUSE OF THE PLANETARY DISTANCES.

LET the three circles, fig. 2, represent the circumference of the Sun in three successive stages of expansion from heat. A force acting on the Inner Wheel is such as to make it turn on its axis till the first proportional lies on the line S $x$. Suppose a drop to fall here from the rotating molten mass, and to form Mercury. The force, increasing as the wheel goes round, now sends it round on its axis, and along the line at the same time till the second proportional reaches the line. The drop falls forming Venus. After throwing off each planet, the wheel goes back like a rocking-stone and comes forward with accumulated force. It now revolves till $b'$ is on $a$, and then runs on to the third proportional, the Earth. The wheel repeats the process till $c'$ is on $a$, and then runs on to the fourth proportional, Mars. The revolution of the Inner Wheel is now completed. The following approximate ratios of the Inner Wheel show the increasing or accumulating force: $b'$, $c'$, $d'$, indicating the distance between the planets. $a : b' :: b' : c'$; and $b' : c :: b' + c' : d'$.

Sum $(a + b' + c' + d') = d = 15{\cdot}2$. The ratios of the distances from the Sun are: $2{\cdot}8 : 3{\cdot}9 :: 7{\cdot}2 : 10$.

The Middle Wheel, the first proportional of which contains the sum of the distances $(a + b' + c' + d' = 15{\cdot}2)$ of the Inner Wheel, now revolves till its second proportional reaches the line, Asteroids. In a similar way the third proportional marks off Jupiter, and the fourth, Saturn. One revolution of the Middle Wheel is now completed; but as the sum of its distances is (or should be) equal to twice its fourth proportional, the Middle Wheel makes a second revolution at once. The drop falls, Uranus. The ratios of the Middle Wheel are:—

$a : b :: d : e$; and $d : e :: f : g$; then $h = (d + e + f + g.)$

The Outer Wheel has for its first proportional the fourth proportional of the Middle Wheel, and for its second proportional the sum of the distances of the Middle Wheel. Hence, the distances being proportionals, $g : h :: k : l$. But $g$ is the radius, $h$ the diameter, and $l$ the circumference; hence $k$ is the semi-circumference. Again, as in proportion, the product of the extremes is equal to the product of the means, the proportionals on fig. 2 being for the Outer Circle 95·6 : 176·4 :: 326 : 600; hence, 191·2 : 176·4 :: 326 : 300. In other words, the radius and the circumference being the extremes, and the diameter being one of the means, the semi-circumference is necessarily the other. In this way it is found that the accumulated force is now such as to send round the Outer Wheel from its first proportional a distance equal to its second proportional with the second proportional of the Middle Wheel added to it (176·4 + 28). The drop falls, Neptune. The Outer Wheel now completes the revolution, the undiscovered planet being twice the distance of Neptune from the Sun.

As the distances on the Outer Wheel are not marked off directly by the proportionals of fig. 2, like those of the Middle and Inner, it is desirable to see as clearly as possible how they are found. There are two ways of dividing into the proportionals, namely, the one in the figure, and the other by making the distance between the first and second proportionals equal to 7·2; the third proportional thus completing the circle, and the fourth proportional being a second revolution of the circle. If the Middle Wheel recoil or rock back so as to lay each entire distance on the line, the work is equal to two revolutions, while by this method (fig. 2) only one revolution of the wheel is really made. The distances lie doubled on the line, and the second revolution of the Middle Wheel is only as it were the tightening of the line. These two revolutions form the first and second proportionals of the Outer Wheel before it is in motion. The position of the third proportional