

Sophia et Sapiens

THE TYRANT AND THE BRIDE

If the NUMBER of the TYRANT is 9, what is the NUMBER of the BRIDE ?

PRELIMINARY REMARKS

The present approach to Plato's dialogues does not attempt to suggest what Plato thought, meant, or implied. Instead, the material is presented here in the form of mathematical problems for the readers to solve for themselves, should they wish to, for in the final analysis it is what the reader understands that is important, not what is proposed by others, however erudite they might be. What is required is a modicum of mathematical skill, fundamental scientific concepts and an open mind. This is no "Royal Road" to the "Philosopher's Stone," but mathematics pure and simple to provide a useful and necessary starting point. The end will ultimately remain with the reader and the reckoner; for this matter increases in scope and complexity as it develops.

INTRODUCTION

Plato's *Republic* is an enduring and much admired work, but the two mathematical problems presented here have nonetheless confuted *hundreds*, if not *thousands* of inquiring minds since Plato's time [427 to 347 BC]. So, be forewarned, this is not a simple matter. Nor is it a matter of simple arithmetic, either. Clues abound everywhere, but watch for phantoms and mis-directions nevertheless. You may find that you have wandered down a lightly trodden pathway; one that cuts across both space and time. Few know where or when it began, and fewer still know where it will end. Galileo and Kepler passed this way in their time too, although neither were able to go the full distance. This is hardly surprising; among other things Plato states in *Laws VII* (818-819) [translation by A.E.Taylor]⁶ that: "ciphering and arithmetic make one subject." But he also says much of relevance in the *Epinomis* (991-992) too, including the observation that:

To the man who pursues his studies in the proper way, all geometric constructions, all systems of numbers, all duly constituted melodic progressions, the single ordered scheme of all celestial revolutions, should disclose themselves, and disclose themselves they will, if, as I say, a man pursues his studies aright with his mind's eye fixed on their single end. As such a man reflects, he will receive the revelation of a single bond of natural interconnection between all these problems.⁶

Those already familiar with this material will no doubt demand to know who says the Tyrant's Number is 9 in the first place, who says the two problems are related in the second, and who is empowered to make such claims in the third. The answer to the first two questions is simple enough - I do. The Tyrant's Number might be considered to be 3, or even 27, but for present purposes I for one prefer 9 (*Phaedrus* 248c-249c); if you take the time to go the full distance you may make your own choice. The third question cannot be explained in a few sentences; the difficulty lies in prevailing attitudes towards the contents of the Dialogues themselves.

A word of caution: there is an unsuspected fork in this timeless pathway. One branch moves forward to new and dangerous territory, the other leads back to the comforting familiarity of the old. Perhaps you have begun to suspect that there may be more to this golden treasury of Dialogues; perhaps you have already dismissed that possibility; but either way, remember your choice if you attempt to connect these problems. Remember also that much space is given over

to " names " in the Dialogues, e.g., *Statesman* (258c–259c), *Laws*, *Theaetetus*, *Republic*, and especially the *Cratylus*. Moreover, be aware that all manner of devices tend to be applied in Plato's dialogues to inform the initiated and confute the uninitiated alike. At times this problem can be exacerbated by differences between translations; by all means consult other sources and alternate interpretations. But in doing so, recognize that this is not necessarily an either/or scenario and that Plato presents these matters so skillfully and that conventional meanings remain applicable.

Note:. The understanding of the "Number of the Tyrant" comes first; do not become overly concerned with harmony in the musical sense, at least initially; it is the third meaning which predominates here, not the second, or the first. Connect the two problems and find the second number, or better, all three. You need not explain anything else - not the diagram, not the *pempad*, nor *the basal four-thirds* or any of the rest. But human nature being what it is, what is to stop you from trying? There is much work to be done with this massive compendium of knowledge. Moreover, moving forward a little distance in time, what was it that motivated the last of the great Platonists, Proclus [410 to 485 AD] to say:

If I had it in my power, out of all the ancient books I would suffer to be current only the *Oracles*⁴ and the *Timaeus*⁸

What is so important about either one, and why are they so paired?

THE NUMBER OF THE TYRANT PLATO: *The Republic*, IX, 587b-588a.

[A] Translation by Paul Shorey (p. 815) ⁶

[587b] ... " Then the tyrant's place, I think, will be fixed at the furthest remove from true and proper pleasure, and the king's at the least." "Necessarily." "Then the tyrant's life will be least pleasurable and the king's most." "There is every necessity of that." "Do you know, then," said I, "how much less pleasurable the tyrant lives than the king?" "I'll know if you tell me," he said. "There being as it appears three pleasures, one genuine and two spurious,[587c] the tyrant in his flight from law and reason crosses the border beyond the spurious, cohabits with certain slavish, mercenary pleasures, and the measure of his inferiority is not easy to express except perhaps thus." "How?" he said. "The tyrant, I believe, we found at the third remove from the oligarch, for the democrat came between." "Yes." "And would he not also dwell with a phantom of pleasure in respect of reality three stages removed from that other, if all that we have said is true?" "That is so." "And the oligarch in turn is at the third remove from the royal man. [587d] if we assume the identity of the aristocrat and the king" "Yes, the third." "Three times three, then, by numerical measure is the interval that separates the tyrant from true pleasure." "Apparently." "The phantom of the tyrant's pleasure is then by longitudinal mensuration a plane number." "Quite so." "But by squaring and cubing it is clear what the interval of this separation becomes." "It is clear," he said, "to a reckoner." "Then taking it the other way about, [587e] if one tries to express the extent of the interval between the king and the tyrant in respect of true pleasure he will find on completion of the multiplication that he lives 729 times as happily and that the tyrant's life is more painful by the same distance" "An overwhelming and baffling calculation," he said, "of the difference between the just and [588a]the unjust man in respect of pleasure and pain!" "And what is more, it is a true number and pertinent to the lives of men if days and nights and months and years pertain to them." "They certainly do," he said.

[A] Translation by Paul Shorey. (p.775) ⁶

[546a] ... Hard in truth it is for a state thus constituted to be shaken and disturbed; but since for everything that has come into being destruction is appointed, not even such a fabric as this will abide for all time, but it shall surely be dissolved, and this is the manner of its dissolution. Not only for plants that grow from the earth but also for animals that live upon it there is a cycle of bearing and barrenness for soul and body as often as the revolutions of their orbs come full circle, in brief courses for the short-lived and oppositely for the opposite; but the laws of prosperous birth or infertility for your race, [546b] the men you have bred to be your rulers will not for all their wisdom ascertain by reasoning combined with sensation, but they will escape them, and there will be a time when they will beget children out of season. Now for divine begettings there is a period comprehended by a perfect number, and for mortal by the first in which augmentations dominating and dominated when they have attained to three distances and four limits of the assimilating and the dissimilating, the waxing and the waning, render all things conversable and commensurable [546c] with one another, whereof a basal four-thirds wedded to the pempad yields two harmonies at the third augmentation, the one the product of equal factors taken one hundred times, the other of equal length one way but oblong,—one dimension of a hundred numbers determined by the rational diameters of the pempad lacking one in each case, or of the irrational lacking two; the other dimension of a hundred cubes of the triad. And this entire geometrical number is determinative of this thing, of better and inferior births.

ADDITIONAL TRANSLATIONS AND VARIANTS

I. THE NUMBER OF THE TYRANT

[B] Translation by Allan Broom: (pp. 269–270)¹²

"Then I suppose the tyrant will be most distant from a pleasure that is true and is properly his own, while the king is least distant." "Necessarily." "And therefore," I said, "the tyrant will live most unpleasantly and the king most pleasantly." "Quite necessarily." "Do you know," I said, "how much more unpleasant the tyrant's life is than the king's?" "I will, if you tell me," he said. "There are, as it seems, three pleasures -one genuine, and two bastard. The tyrant, going out beyond the bastard one, once he has fled law and argument, dwells with a bodyguard of certain slave pleasures; and the extent of his inferiority isn't at all easy to tell, except perhaps as follows." "How?" he said. "The tyrant, of course, stood third from the oligarchic man; the man of the people between them." "Yes." "then wouldn't he dwell with a phantom of pleasure that with respect to truth is third from that other, if what went before is true?" "That is so." "And the oligarchic man is in his turn third from the kingly man, if we count the aristocratic and kingly man as the same." "Yes, he is the third." "Therefore," I said, "a tyrant is removed from true pleasure by a number that is three time three." "It looks like it." "Therefore," I said, "the phantom of tyrannic pleasure would, on the basis of the number of its length, be a plane?" "Entirely so." "But then it becomes clear how great the distance of separation is on the basis of the square and the cube." "It is clear," he said, "to a man skilled in calculation." "The if one turn's it around and says how far the king is removed from the tyrant in truth of pleasure, he will find at the end of the multiplication that he lives 729 times more pleasantly, while the tyrant lives more disagreeably by the same distance." "You've poured forth," he said, "a prodigious calculation of the difference between the two men—the just and the unjust—in pleasure and pain." "and yet the number is true," I said, "and appropriate to lives too, of days and nights and months and years are appropriate to them." " But, of course, they are appropriate," he said.

[C] Translation by John Llewelyn Davies: (pp. 360–361)¹³

Hence, if I am not mistaken, the tyrant will be furthest from, and the king nearest to, true and specially appropriate pleasure." "It is undeniable." "And therefore the tyrant will live most unpleasantly, and the king most pleasantly." "It is quite undeniable." "And pray are you aware of the extent to which the discomfort of the tyrant's life exceeds that of the king's?" "I wait for you to tell me." "There are three pleasures, it appears, -one genuine, and two spurious. Now the tyrant has trespassed beyond these last, has fled from law and reason, and lives with a bodyguard of slavish pleasures: the extent of his inferiority is hard indeed to state, unless perhaps it may be stated thus." "How?" "Reckoning from the oligarchical man, the tyrant stands third, I believe, in the descending line: for the democratical man stood between." "Yes." "Then, if our former remarks were true, must not the pleasure with which he consorts, be, so far as truth is concerned, a copy of a copy, the original of which is in the possession of the oligarchical man?" "Just so." "And again, reckoning from the kingly man, the oligarchical in his turn stands third in the descending line, supposing us to identify the aristocratical and the kingly?" "To be sure, he does." "Therefore the tyrant is thrice three times removed from true pleasure." "Apparently so." "Then it seems that tyrannical pleasure may be represented geometrically by a square number, 9." "Exactly so." "And by squaring and cubing, it is made quite clear to what a great distance the tyrant is removed." "Yes, to an arithmetician it is." "Conversely, if you wish to state the distance at which the king stands from the tyrant in point of reality of pleasure, by working out the multiplication you will find that the former lives 729 times more pleasantly than the latter, or that the latter lives more painfully than the former in the same proportion." "You have bought out an extraordinary result in calculating the difference between the just man and the unjust, on the score of pleasure and pain." "Well," I replied, "I am sure that the number is correct, and applicable to human life, if days and nights and months and years are applicable thereto." "And no doubt they are."

[D] Translation by W.H.D. Rouse: (pp. 388–389)¹⁴

Then the tyrant will be found farthest away from true and proper pleasure, and the king least far." "Necessarily." "So the tyrant's life," I said, "will be the most unpleasant, and the king's the most pleasant." "Inevitably." "Do you know, then," I asked, "How much unpleasant the tyrant's life is than the king's?" "Would you please tell me?" He said. "There are three pleasures, as it seems, one genuine, two spurious. The tyrant deserts law and reason, and crosses the line beyond the spurious ones, and there lives with a mercenary bodyguard of slavish pleasures; and how much inferior he is it is not very easy to tell, except perhaps in this way." "How?" I asked. "I suppose the tyrant comes third from the oligarch, for the democratic man was between them." "Yes." "Then the phantom of pleasure he lives with would be, as regards truth, the third from that man, if what we said is true." "That is so." "But the oligarchic man is again third from the kingly man, if we put aristocratic and kingly into the same series." "Yes, third." "Three times three, then," said I, "the *phantom* of tyrannical pleasure, it seems, according to the number of its magnitude, would be a plane figure." "Exactly." "Square this and bring it to a cube,* and you will see what the distance becomes." "I dare say," said he, "a mathematician could see it!" "Conversely, if one wanted to say how far off the king is from the tyrant in true happiness, when he has done his multiplication sum he will find that the king lives sevenhundredandtwentyninetimes** more happily than the tyrant, and the tyrant justthesamenumberoftimes** more wretchedly!" "Ho!" said he, "what a tempestuous tornado of numbers you have poured over our heads in your differentiation of these two gentlemen, the good man and the bad man, and their pleasures and pains!" "My dear sir," I said, "a true number and a proper number for men's lives, if days and nights and months and years are proper to them!" "Oh yes," he said, "they are proper enough."

* Rouse adds in a footnote: "Literally, ' by third increase,' which to the Greeks meant changing a square into a cube"
** According to Rouse, " The long Greek number and long Greek words used were no doubt part of the jest."

[E] Translation by Thomas Taylor (pp. 274–275)¹⁵

The tyrant then, I think, shall be the most remote from true pleasure, and as such as is most properly his own, and the other shall be the least." "Of necessity." "And the tyrant," said I, "shall lead a life most unpleasant, and the king the most pleasant." "Of great necessity." "Do you know then," said I, "how much more unpleasant a life the tyrant leads than the king?" "If you tell me," said he. "As there are three pleasures, as it appears, one genuine, and two illegitimate; the Tyrant in carrying the illegitimate to extremity, and flying from all reason, dwells with slavish pleasures as his life-guards, and how far he is inferior is not easily to be told, unless it may be done in this manner." "How?" said he. "The Tyrant is third remote from the Oligarchic character; for the Democratic was in the middle between them." "Yes." "Does he not then dwell in the third image of pleasure, a copy of a copy with reference to the truth, if our former reasonings be true?" "Just so." "But the Oligarchic is third again from the Royal, if we suppose the Aristocratic and the Royal the same." "He is the third." "The tyrant then," said I, "is three times thrice remote from true pleasure." "It appears so." "A square number then," said I, "may be the image of tyrannical pleasure—namely, 9." "Certainly." "But by squaring and cubing this, it is manifest by how great a distance he is remote." "It is manifest," said he, "to the computer at least." "If now, anyone reckon how far the King is distant from the Tyrant as to truth of pleasure, shall he not, on completing the multiplication, find him leading the more pleasant life by 729 times, and the Tyrant the more wretched by the same distance?" "You have heaped up," said he, "a prodigious account of the difference between these two men, the just and the unjust, with reference to pleasure and pain." "Yet the numbers are true," said I, "and corresponding to their lives, if indeed days, and nights, and months, and years, correspond to them." "But these," said he, "do correspond to them."

[F] Translation by C. D. C. Reeve (pp. 290–291)¹⁶

SOCRATES: There are, it seems, three pleasures: one genuine and two illegitimate. The tyrant is at the extreme end of the illegitimate ones, since he sees both law and reason and lives with a bodyguard of slavish pleasures. But it is not at all easy to say just how inferior he is except perhaps as follows.

GLAUCON: How?

SOCRATES: The tyrant is somehow at a third remove from the oligarch, since the democrat was in the middle between them.²²

GLAUCON: Yes.

SOCRATES: Won't he also live with a phantom of pleasure, then, that, as regards truth, is at a third remove from that other—if what we said before is true?

GLAUCON: He will.

SOCRATES: But the oligarch, in turn, is at a third remove from the king,²³ if we assume king and aristocrat to be the same.

GLAUCON: Yes, third.

SOCRATES: So a tyrant is removed from true pleasure by a numerical value of three times three.

GLAUCON: Apparently.

SOCRATES: So, on the basis of the size of this numerical value, it seems the phantom of the tyrant's pleasure is a plane figure.

GLAUCON: Exactly.

SOCRATES: On the basis of its square and cube, in that case, it becomes clear how far removed it is.

GLAUCON: Clear to someone skilled in calculation, anyway!

SOCRATES: Turning it the other way around, then, if someone wants to say how far the king is removed from the tyrant in terms of true pleasure, he will find, if he completes the calculation, that he lives 729 times more pleasantly, while the tyrant lives the same number of times more painfully.²⁴

GLAUCON: That's an extraordinary calculation of the difference between the two men—the just one and the unjust one—in terms of their pleasure and pain!

22. Third because the Greeks always counted the first as well as the last member of a series. The day after tomorrow was the third day.

23. Because the Timocrat is between them.

24. Socrates' mathematics is difficult to follow. He seems to have something like this in mind: the tyrant's pleasure is a two-dimensional image (a plane figure) of the true, three-dimensional pleasure of the philosopher. Hence, if a one-unit square represents the degree of closeness to true pleasure of an image nine times removed

from it, true pleasure should be represented by a nine-unit cube. It follows that the king lives 729 times more pleasantly than the tyrant. However, in order to reach the significant number 729—there are 729 days and nights in a year of 364 twentyfour-hour days and 729 months in the "great year" recognized by the Pythagorean philosopher Philolaus—Socrates has had to make two rather fast moves. First, he illegitimately capitalizes on the Greek manner of counting series in order to count the oligarch twice, once as the last term in his first series (tyrant, democrat, oligarch) and again as the first term in his second series (oligarch, timocrat, king). Second, he multiplies the number of times the tyrant is removed from the oligarch by the number of times the oligarch is removed from the king, when he should have added them. In fact, the tyrant is only five times removed from the king, and so lives only 125 times less pleasantly!

[G] Translation by Francis MacDonald Cornford (pp. 314–315)¹⁷

There are, it seems, three kinds of pleasure, one genuine and two spurious. The despot, in his flight from law and reason, goes beyond bounds even of the spurious kinds, to surround himself with pleasures comparable to a bodyguard of slaves. The measure of his inferiority can hardly be expressed unless perhaps in this way. The despot, you remember, was at the third remove from the oligarch; for the democratic man came between. If that was right, the pleasure he enjoys will be a phantom three times less real than the oligarch's. And the oligarch himself was third in rank below the king, if we identify kingship with the rule of the best. So the number representing the distance that separates this phantom pleasure of the despot from reality will be three times three; and when that number is squared and cubed, calculation will show how great the interval becomes. Conversely, you will find that, in respect of truth and reality, the kingly life is seven hundred and twenty-nine times the pleasanter, and the despot's more painful by the same amount.¹

I feel quite overwhelmed by your estimate of the difference between the just and unjust man, on the score of pleasure and pain.

All the same, my figure is correct and applicable to the lives of men as surely as the reckoning of days and nights, months, and years.² And if the good and just man is so far superior to the bad and unjust in point of pleasure, there is no saying by how much more his life will surpass the other's in grace, nobility, and virtue.

1. The translation here simplifies the text, which is perhaps intentionally obscure. It is not explained why 9 is to be raised to the third power, 729. J. A. Stewart, *Myths of Plato*, 349, notes the importance attached later to this number, which is the square of 27 as well as the cube of 9. Plutarch makes it the number of the Sun (*de anim. proc.* 31), which stands for Reason (nous) in *de fac. in orbe lunae*, 28.

2. According to Censorinus *de die nat.* 18–19 (Diels-Kranz, Vors* 44 a 22) the Pythagorean Philolaus reckoned 364 ½ days (and presumably the same number of nights) to the year, and $2 \times 364 \frac{1}{2} = 729$. This may explain 'days and nights'. He had also a 'great year' of 729 months. These numerical correspondences between macrocosm and microcosm, which seem to us fantastic, may not be literally meant, but they cannot have been mere nonsense to Plato.

II. THE NUMBER OF THE BRIDE

PLATO: *The Republic*, VIII, 546a-547a

[B] Translation by Allan Broom (pp. 232–233)¹²

For a divine birth there is a divine period comprehended by a perfect number; for a human birth, but the first number in which root and square increases, comprising three distances and four limits, of elements that make like and unlike, and that wax and wane, render everything conversable and rational. Of these elements, the root four-three mated with five, thrice increased, produces two harmonies. One of them is of equal length in one way but is an oblong, one side, of one hundred rational diameters of five, lacking one for each, or if of irrational diameters, lacking two of each; one the other side, of one hundred cubes of three. This whole geometrical number is sovereign of better and worse begettings.

[C] Translation by A.G. Laird (p. 29)⁵

There is for a divine creature a period which a perfect number contains; for a human creature (there is a number) in that figure in which first products that are squares and rectangles, equaling and being equaled, if arranged in a proportion with three intervals and four terms, the terms being the sides of the squares and the sides of the rectangles, both if they are increasing and if they are decreasing, showed all in proportion and rational to one another; of which 3-4-5 type, if the numbers are made solid, furnishes two harmonies, the one a square with its side multiplied by 100, the other equal in area to the former but oblong, one side of 100 squares of rational diameters of five, each lacking one, or irrational diameters each lacking two, the other side 100 cubes of 3. This total, a geometric number, is in control of such a creature, of better and of worse births.

[D] Level I: Interpretation (General Meanings) by Robert Brumbaugh. (p.110)³

For divine becomings, there is a period comprehended by a perfect number; but for human, by the first in which developing capacities, dominating and dominated, on realizing three stages determined by four points [in the field of these processes of] becoming like and unlike, growing and declining, make all things conversable with and rational in respect to one another. Of these [the element representing referents in] in a ratio of 4 to 3, in lowest terms, married to the pempad, produces two harmonies when thrice augmented. Each side of the former [equals] numbers produced by squaring "the diagonal lines" that represent a "rational" component of the pempad, each diminished by one; [the other side equals numbers produced by squaring the "diagonals" that represent a component of the pempad which is] "irrational," [each of these diminished by] two. The latter [harmony] equals one hundred cubes of three. And this whole thing is a geometrical number.

[E] Translation by Thomas Taylor (pp. 274–275)¹⁵

It is indeed difficult for a city thus constituted to be changed. But as everything which is generated is subject to corruption, neither will such a constitution as this remain for ever, but be dissolved. And its dissolution is this. Not only with respect to terrestrial planets, but likewise in terrestrial animals, a fertility and a sterility of soul as well as of body takes place, when the revolutions of the heavenly bodies complete the periphery of their respective orbits; which are shorter to the short-lived, and contrariwise to such as are the contrary: and with reference to fertility and sterility of our race, although those are wise that you have educated to be governors of cities, yet will they never, by reason in conjunction with sense, observe the proper seasons, but overlook them, and sometimes generate children when they ought not. But the period to that which is divinely generated is that which the perfect number comprehends; and to that which is generated by man, that in which

augmentations surpassing and surpassed, when they shall have received these restitutions and four boundaries of things assimilating and dissimilating, increasing and decreasing, shall render all things correspondent and effable; of which the sequitertian progeny, when conjoined with the pentad, and thrice increased, affords two harmonies. One of these, the equally equal, a hundred times a hundred; but the other, of equal length indeed, but more oblong, is of a hundred numbers from effable diameters of pentads, each being deficient by unity, and from two numbers that are ineffable; and from a hundred cubes of the triad. But the whole geometric number of this kind is author of better and worse generations

[F] Translation by C. D. C. Reeve (pp. 240–241)¹⁸

It is difficult for a city constituted in this way to change. However, since everything that comes-to-be must decay, not even one so constituted will last forever. On the contrary, it, too, must face dissolution. And this is how it will be dissolved: not only plants that grow in the earth, but also animals that grow upon it, have periods of fertility and infertility of both soul and bodies each time their cycles complete a revolution. These cycles are short for what is short-lived and the opposite for what is the opposite. However, even though they are wise, the people you have educated to be leaders in your city will, by using rational calculation combined with sense-perception, nonetheless fail to ascertain the periods of good fertility and of infertility for your species. Instead, these will escape them, and so they will sometimes beget children when they should not.

Now, for the birth of a divine creature there is a cycle comprehended by a perfect number; while for a human being, it is the first number in which are found increases involving both roots and powers, comprehending three intervals and four terms, of factors that cause likeness and unlikeness, cause increase and decrease, and make all things mutually agreeable and rational in their relations to one another. Of these factors, the base ones—four in relation to three, together with five—give two harmonies when thrice increased. One is a square, so many times a hundred. The other is of equal length one way, but oblong. One of its sides are 100 squares of the rational diameter of five each diminished by one, or alternatively 100 squares of the irrational diameter each diminished by two. The other side are 100 cubes of three. This whole geometrical number controls better and worse births.

[G] Translation by Francis MacDonald Cornford (pp. 262–264)¹⁹

Hard as it may be for a state so framed to be shaken, yet, since all that comes into being must decay, even a fabric like this will not endure forever, but will suffer dissolution. In this manner: not only for plants that grow in the earth, but also for all creatures that move thereon, there are seasons of fruitfulness and unfruitfulness for soul and body alike, which come whenever a certain cycle is completed, in a period¹ short or long according to the length of life of each species. For your own race, the rulers you have bred for your commonwealth, wise as they are, will not be able, by observation and reckoning, to hit upon the times propitious or otherwise for birth; some day the moment will slip by and they will beget children out of due season. For the divine creature there is a period embraced by a perfect number;² while for the human there is a geometrical number determining the better or worse quality of the births.³

Although Cornford provides no numerical details in this paragraph he nevertheless includes three explanatory footnotes:

1. This period has been taken to be the period of gestation, at the end of which the seed of the living creature ('soul and body') either comes successfully to birth or miscarries. Aristotle (*On the Generation of Animals*, iv. 10, 777 b 16) remarks:

'In all animals the time of gestation and development and the length of life aim at being measured by naturally complete periods. By a natural period I mean, e.g. a day and night, a month, a year, and the greater times measured by these, and also the periods (phases) of the moon.'

2. The 'divine creature', is the visible universe, which is called a 'created god' in the cosmological myth of the *Timaeus*. The perfect number is probably the number of days in a Great Year, which is completed when all the heavenly bodies come back to the same relative positions (*Tim.* 39 d).

3. The extremely obscure description of this number, which has been variously interpreted, is omitted. Ancient evidence points to some relation between two numbers, both ultimately based on the factors 3, 4, 5, representing the sides of the 'Pythagorean' or 'zoogonic' right-angled triangle.

(1) One is $216 = 3^3 + 4^3 + 5^3 = 6^3$. This was called the 'psychogonic cube', as expressing the number of days in the gestation period of the seven-months' child. The period of the nine-months' child was obtained by adding $60 = 3 \times 4 \times 5$.

(2) The other number is $12,960,000 = 3,600^2 = (3 \times 4 \times 5)^4$, the number of days in a Great Year, reckoned as 36,000 solar years of 360 days each. If Plato does describe two numbers, and not (as some hold) the second only, he has not explained how the two should be brought into relation.

The serious idea behind this seemingly fanciful passage is the affinity and correspondence of macrocosm and microcosm and the embodiment of mathematical principles in both.

Some final points. Firstly, although the original Greek versions should supply the best information, we deal here with various English translations. Secondly, as commentators have noted from time immemorial, there are playful elements in the Dialogues; but even so, the matters under consideration are not frivolous. Thirdly, the additional translations are provided to demonstrate the variance that exists, and also to supply further insights and potential triggers. Note that solutions to these enigmas have been proposed in the past (see Brumbaugh, pp.143-146), but to date none have found universal acceptance.

The fundamental problem, as Jowett (p.113) points out, is that: "*the obscurity arises from our want of familiarity with the subject.*"

Finally, do not become easily discouraged; the last part is especially difficult; but nevertheless, "Seek therein, and be not weary, the result justifies the labour." Lastly, take strength and guidance from what Confucius has to say about the Superior Man:

*"If another man succeed by one effort, he will use a hundred efforts.
If another man succeed by ten efforts, he will use a thousand."*

THE NUMBERS ?

All Three? All Four? Or Five? Or the One and the Many?

This problem ends here, one way or the other; but you may wish to carry on and go for gold. By all means explore all dimensions, but be sure to log each step carefully if you do...

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2. ARISTOTLE: *Politics*. Book V, 12, 8:

He only says that nothing is abiding, but that all things change in a certain cycle: and that the origin of the change is a base of numbers which are in the ratio of 4:3 and this when combined with a figure of five gives two harmonies: he means when the number of this figure becomes solid.

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. : POSTSCRIPT : .

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