THE ARCHITECTURAL MODELS OF THE PLATONIC COSMOS DESCRIBED IN THE REPUBLIC

The Big Horn Medicine Wheel[1], The Pantheon[2], some wheel-windows[3], the Shakers' Round Stone Barn[4], and the octagonal Christian Baptisteria[5] fit the description of Cosmos by Plato in the *Republic*[6].

The architecture of BHMW is analogous to the mathematical composition of Roman water-wheels; it follows the Masonic principle of „numbers three and seven", it is based on the scheme called octagram and it represents the geocentric Universe[7].

The Medicine wheel in the Big Horn Mountains, Wyo, is composed of irregular stones, placed on the barren ground 2940 m above the sea level, in the form of a central cairn connected with 28 spokes to the rim, which holds six unevenly spaced outside cairns. Its rim and its 28 spokes recall the composition of Roman water-wheels[2].

The water-wheel from the Roman mine in San Domingo, Spain, has 22 spokes. Its diameter and circumference are 7 modules of 7 *trientes* and 22 modules of 7 *trientes* long, respectively. Ratio 22: 7 is practically equal to π. A similar wheel from Rio Tinto, Spain, one quarter of which is exhibited in the Roman Room of the British Museum, is equal in diameter, but it has 28 spokes and 28 scoops on its perimeter. Its circumference is divided in 28 equal intervals, 1 module of 5,5 *trientes* long:

$$22\ \mathrm{M}(7\ \textit{trientes}) = 28\ \mathrm{M}(5{,}5\ \textit{trientes}).$$

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[1] J. A. Eddy, Astronomical Alignement of the Big Horn Medicine Wheel. — *Science* vol. 184, 4141, 9174.

[2] T. Kurent, The Modular Composition of Roman Water-Wheels. — *Archaeometry* vol. 10, 1967.

[3] T. Kurent, L. Muhič, Dubrovački lakat *i* racionalizacija broja π u kompoziciji rozete Svetog Spasa. — *Čovjek i prostor*, ČiP XXV 306, Zagreb, rujan 1978.

[4] *The Shakers*, Neue Sammlung, Munich 1974.

[5] Christian baptisteria are octagonal since Saint Ambrosius of Milan (340?—397) who probably knew not only the role of octagram in architecture but also the role of the platonic Soul, described in *Timaeus*, in the composition of Cosmos. See — T. Kurent, Atlantis after Critias and the Numbers of the Platonic Lambda. — Paper sent to *Živa Antika* in 1978.

— T. Kurent, *Cosmogram of the Romanesque Basilica at Stična*, Fakulteta za arhitekturo, Ljubljana 1977, p. 92.

[6] Plato, *Republic*, 616B—617C.

[7] T. Kurent, *Cosmogram of The Romanesque Basilica at Stična*, Fakulteta za arhitekturo, Ljubljana 1977, pp. 35, 58—60, 91—92.

Having this in mind, I have divided the average inner diameter of the BHMW in 7 modules of 7 units each; the unit proved to be equal to the Stonehenge „megalithic foot", 335 mm long[8]. As the Rio Tinto wheel, the BHMW has 28 spokes. At the circumference, its 28 spokes are theoretically 5,5 „megalithic ft" apart. The notion that the BHMW's 28 radii symbolize the 28 days of the lunar month[1], or the chain of the ambicable numbers[9] composed of 28 concatenated *numeri*, is posterior. So is the association of divisors 22 and 28 with 22, 11, and 57 loops[10] on the trajectories traced by Mars, Jupiter, and Saturn, respectively, as they are seen from the Earth[11].

Further modular analysis discloses that the outer diameter of the monument, including the outside cairns, is 10 M(7mf) long. Clearly, the ratios

$22:7 \sim \pi$ and

$10:7 \sim \sqrt{2}$ are built in the monument, which reminds us of the Masonic teaching that „numbers three and seven are the basis for everything[12]". Tolstoy's „number three" is the triangular number called *tetractys*, comosed of 10 pebbles. „Number sveven" is a heptagonal number, composed of 7 *calculi*, the gnomon[13] of which is made of 11 pebbles. The ratios

$10:7 \sim \sqrt{2}$ and

$11:7 \sim \pi:2$ are part of the „highest wisdom (that) has but one science explaining the whole creation and man's place in it[12]".

The description of the platonic Cosmos in the *Republic*[6] is reflected in the composition of the BHMW. Here is my translation of the key sentences:

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[8] One „megalithic foot" equals 335 mm. See

— T. Kurent, Stonehenge and the Vitruvian Amusium. — *Arhitectural Association Quarterly*, vol. 7 no. 3, 1975.

The 335 mm long rhythm in Stonehenge sizes with the working name „megalithic foot" is probably the northern foot, described as the unit used „from about 3000 B. C. to the midnineteenth centry A.D. "in Asia, Africa, and Europe, including England, Scotland, and Ireland, by

— F. G. Skinner, Measures and Weights, Chapter III: The Northern, the Sumerian, and the Royal Persian Cubits. — In: *History of Technology*, edited by Ch. Singer, E. J. Holmyard, and A. R. Hall, vol. I, Oxford, At the Clarendon Press, 1954.

[9] A. H. Beiler, *Recreations in the Theory of Numbers*, Chapter IV: Just Between Friends, Dover, New York 1966.

[10] Relation between numbers 57 and 28 can be understood if we know that a figured number is always an integer, equal also to its related numbers which are 2, 4, 8 ... and/or 10, 100, 1000 ... times larger or smaller. Consequently, one half of 57, rounded in a whole number, is 28. See

— T. Kurent, *Cosmogram of the Romanesque Basilica at Stična*, Fakulteta za arhitekturo, Ljubljana 1977, p. 34 and 90.

[11] See the Chapter Starry Messenger and the illustration 85 in the book

— J. Bronovsky, *The Ascent of Man*, Science Horizon Inc. 1975.

[12] From the Pierre Bezouhoff's diary in the *War and Peace* by Leo Tolstoy.

„ . . . they came to the place from which they could see a light like a column stretching from above through all the earth and sky . . . They came to this light in one day march and there in the middle of the light they saw the ends of chains stretching from the heaven. For this light was the girdle of the firmament and held together all the revolving dome... To these ends was fastened the spindle . . . around which all the orbits revolved. Its trunk . . . (and) the whorl were made of adamant . . . The shape of the great whorl was hollow . . . and smaller one was fitting into it, and a third and a fourth and four more . . . There were eight whorls altogether fitting into each other . . . their rims were visible from above like circles, forming one whole whorl around the shaft . . . On each of the circles was sitting a Siren singing one sound and they all turned around, so that there was a harmony of all the eight. They were sitting around at equal distances . . ."

The „spindle around which all the orbits revolved" is obviosly resting in the socket of the BHMW's central cairn. The „chains that held together al the revolving vault" can be recognized as the BHMW's spokes. „The great whorl" is the Wheel's rim. „The eight Sirens sitting on the rim at equal distances" are represented by the six still remaining and two missing outside cairns. Three of the outer cairns are still *in situ* evenly spaced apart, but the remaining three are displaced.

Geometrically, the eight Sirens are sitting in the corners of an octagram[14] inscribed in the circumferential circle and circumscribed around the square enclosing the rim. The diagonal of this octagram is 5 M(14 mf) and its side is 2 M(14 mf). The modular mutiples 2 and 5 are terms of the Pell series

0 1 2 5 12 . . .

The connection of the BHMW with fhe Universe and with architecture is traceable in the belief of the Crow Indians that the Sun built the Wheel to show how to build the tepee[15].

The Pantheon's dome is mathematically analogous to the Rio Tinto wheel. It is 7 M(14 *cubiti*) in diameter and 28 M(11 *cubiti*) in circumference. Its 28 supporting ribs are spaced 1 M (11 *cubiti*) apart at the circumference. Its top is opened with a circular hole to let in the „pillar of light", which makes it symbolically and functionally similar to wheel-windows from the Romanesque to the Renaissance period.

The wheel-windows[5] with a central *oculus* and ridiating spokes resemble not only the platonic geocentric Cosmos, but also the

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[13] Gnomon means the increment of a figured number.

[14] Octagram is an architectural proportioning scheme. The constant ratios between segments of lines forming an octagram are rationally approximated by ratios of Pell numbers. See

— P. H. Scholfield, *The Theory of Proportion in Architecture*, Cambridge University Press 1953.

[15] J. B. Taylor, *Herald Tribune* (Casper, Wy), 16 March 1941.

teaching of Anaximandros[16] that the Sun has the form of a wheel. As the wheel's hub is void and as the spokes connect the wheel's centre and the rim, so the Sun, radiating light from its empty middle, sends the rays and illuminates the circle beyond its circumference. The Sun is a circle, 28 times as large as the Earth, and similar to a wheel[17]. Obviously, the Anaximandros' number 28 is connected with the 28 sectors of a circle. The wheel-windows have often 12 or 24 spokes[18] but in Dalmatia I have found a few examples with 11 and 14 spokes, mathematically based on the modular approximation of π. The wheel-window of Saint Savior at Dubrovnih, e.g., with its 14 spokes is 7 modules of 14 digits in diameter and 22 M (14 d) or rather 28M(11 d) in circumference. The axial interval between the spokes at the perimeter is 22 digits[3].

The Shakers' Round Stone Barn has 28 rafters in the outer part of its roof. It is 98 ft or 7 M(14 ft) in diameter and 28 M(11 ft) in circumference of the roof. Its central lantern has the function of the central opening or *oculus*, emiting the pillar of light of the platonic Cosmos and symbolizing the emission of rays from the Anaximadros' Sun.

It seems that the platonic geocentric Universe borrowed both, the Anaximandros' central light and the 28 radii of light emanating from the centre, and the octagramatic scheme of the platonic heliocentric Universe the copy of which is Atlantis[19].

The modular division of a circumference in 28 intervals was obviously a routine practice. It is not only built in numerous circular architectures but also in the tale of King Arthur's Table Round[20]. Merlin recruited 28 knights for the Round Table and the Arthur's Table at Winschester Castle is 18 ft in diameter and 56 ft in circumference, which leaves a 2 ft wide place for each of its 28 sitters.

The octogonal baptisteria are geometrically based on octagram as it is evident from the sketch by Leonardo[21]. The octagram, called τὸ ὀκτάγωνον ὀχῆμα by Gregory of Nyssa[22] symbolized to Clemens of Alexandria[23] the spiritual Cosmos[24]. Eight is a cube connected with the sphere of the Universe and the seven planets[25]. The

[16] Anaximandros (611—547 B.C.) was a Greek astonomer from Miletus.

[17] Diels, *Fragmente der Vorsokratiker*, edited by Krantz. DK 12 A 21 and DK 12 A 22.

[18] Division of a circle in 6, 12, 24 . . . parts is geometrical, whereas the division in 22 or 28 parts is modular.

[19] T. Kurent, Atlantis after Critias and Numbers of the Platonic Lambda. — Paper sent to *Živa Antika* in 1978.

[20] Sir Thomas Malory, *Le Morte d'Arthur*, edited by J. Cowen, vol. I, Penguin edition 1969, p. 94.

[21] Drawing of a plan for baptisterium over a scheme of octagram by Leonardo da Vinci (Bibliothèque Nationale, Paris, MS 2037).

[22] Gregory of Nyssa (331?—?396 A. D.) was one of the fathers of Eastern Church.

[23] Clemens of Alexandria (150?—?220 A. D.) was a Greek theologian.

[24] Clements of Alexandria, *Stromata* V, 6 § 36, 3 (II, 350, Z. 17 f. Stählin).

[25] Clements of Alexandria, *Stromata* VI, 16 § 140, 2 3 (GCS: Clem. II, 503, Z. 7 ff Stählin).

eight spheres turning around the Earth were called πάντα ὀκτώ[26]. But the original practical Pythagorean understanding of the octagram and its role in compostion was absorbed by the Christian theosophy and gradually transformed in the number mysticism[27]. However, the old scheme of the geocentric universe remained modelled in the baptisteria. The central fountain and the eight peripheral chapels are analogous to the central cairn and the eight peripheral cairns of the BHMW, though in the Christian teaching the old symbolism was lost and a new meaning was substituted. „Ignorance of numbers ... prevents us from understanding things that are set down in the Scripture in a figurative and mystical way" said Saint Augustine[28].

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KRATKA VSEBINA

Tine Kurent: ARHITEKTONSKI MODELI PLATONOVEGA VESOLJA, OPISANEGA V DRŽAVI

Platonovo geocentrično vesolje (Država 616B — 617C), kjer na osmih, drug v drugega vloženih kolobarjih, pripetih z žarki na osrednji steber luči, sedi v enakih razdaljah osmero siren in se vozi naokrog pojoč vsaka svojo noto, je pogosto upodobljen arhitektonski motiv.

Pri tem je zanimivo, da je žarkov vedno 28, kar spominja na Anaximandrov nauk, da je sonce 28 krat večje od zemlje (Diels-Krantz, DK 12 A 21 in DK 12 A 22), matematično pa je utemeljeno z racionalno aproksimacijo Ludolfovega števila, kjer premeru 7 modulov po 7 enot odgovarja obod 28 modulov po 5,5 enot:

28 M(5,5 enot) : 7 M(7 enot) $\sim \pi$.

Geometrično pa osmerokotno shemo predstavlja oktagram.

Najpomembnejši arhitektonski modeli geocentričnega vesolja so The Big Medicine Wheel, Pantheon, rozete na cerkvah, The Shakers' Round Stone Barn in krščanski baptisteriji.

Čarovniški kolobar v gorovju Big Horn v Wyomingu je sestavljen iz kamenja. Njegov premer je velik 7 M(7 northern feet). obod pa 28 M(5,5 n.ft). Osem siren ponazarja osem kupov kamenja (cairns), v središču zloženi cairn pa je opora za steber luči.

Kupolo Pantheona s premerom 7 M(14 komolcev) nosi 28 reber. Obod kupole meri 28 M(11 komolcev). Oculus na vrhu kupole ponazarja steber luči.

Rozeto na cerkvi Sv. Spasa v Dubrovniku sestavlja okulus, od koder se 14 (torej še enkrat manj kot običajnih 28) špic peri proti obodu. Premer rozete je velik 7 modulov po pol dubrovniškega komolca, ali po 14 dubrovniških digitov, obod pa meri 28 M(11 digitov), ali bolje 14 M(22 digitov).

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[26] Theon of Smyrna, *Expositio rerum mathematicarum*, O.S. O.S. 105 Z. 12 Hiller.

[27] F. J. Dölger, *Antike und Christentum*, Band IV, Heft 3: Zur Symbolik des altchristlichen Taufhauses.

— E. Read Sunderland, Symbolic Numbers and Romanesque Church Plans. — *Journal of the Society of Architectural Historians* XVIII, 1959, pp. 94—103.

[28] Aurelius Augustinus (354—430). Early Christian church father and philosopher.

— Works of Augustine, *On Christian Doctrine*, II, 25.

Okroglo streho šejkerskega skednja v Hancocku v Massachusettsu nosi 28 špirovcev. Njen premer je 7 M(14 ft), obod pa 28 M(11 ft).

Od sv. Ambroža Milanskega naprej so tudi krščanski baptisteriji osmerokotni. Znan je načrt za krstilnico, ki ga je na osnovi oktagrama narisad. Leonardo da Vinci. Osmerokotni krstilni bazen (steber luči) leži sredi osmerokotnega prostora, obdanega z osmimi kapelami (osem siren).

Illustration 1.

The Big Horn Medicine Wheel, Wy, is based compositionally on the scheme of octagram, holding on its corners the outer cairns (A, B, C, D, E, F, G, H). Still in their place are only three of the cairns (B, C, D); the other three are displaced and two of them are destroyed. The inner diameter of the wheel's rim (D_1) is 7 modules of 7 northern ft long and, consequently, the rim's theoretical inner circumference equals 28 modules of 5,5 ft (C_1):

$$28\ M(5{,}5\ ft) : 7\ M(7\ ft) = \pi.$$

The difference between D_1 and the octagram's diagonal is the thickness of the rim. The monument's diameter (D_2) equals 10 M(7 ft) and the corresponding circumference (C_2) is, in round Pell figures, 32 M(7 ft) long. Consequently, the theoretical interval between the cairns at the rim is either 3 M(7 ft) = 21 ft, which agrees with the second Pell series:

1 0 1 3 7 17 ... ,

or 4 M(5,5 ft) = 22 ft, if one approximates π with the ratio

28 M(5,5 ft) : 7 M(7 ft).

The difference between 21 and 22 ft is due to the approximation of the irrational π with ratios of the whole numbers.

At the outer perimeter, the interval between cairns is 4 M (7 ft), which corresponds with the first Pell series:

0 0 1 2 5 12 ...
4 10

The modular circular composition based on the rational aproximation of π with the ratio

22 M(7 units) : 7 M(7 units)

or with the ratio

28 M(5,5 units) : 7 M (7 units)

was a routine method before the introduction of π. Compare with the Ill. 2.

The BHMW is a model of the platonic Cosmos as described in the *Republic*. Its central cairn with its socket is supposed to hold the pillar of light. The cairn is connected to the whell's rim with radii sfmbolizing the girdle of light. The wheel's rim is the great whorl made of eight orbits. The wheel's outer cairns stay for the eight Syrens.

Illustration 2.

Some Roman water-wheels, e.g. the one from San Domingo, are 7 modules of 7 *trientes* in diameter. Their corresponding circumference is 22 modules of 7 *trientes* long. They have 22 spokes and 22 scoops. Other similar wheels, e.g. the one from Rio Tinto, are of the same diameter, but composed of 28 spokes and 28 scoops. Their circumference is consequently 28 modules of 5,5 *trientes*.

22 M(7 *trientes*) = 28 M(5,5 *trientes*).

The Pantheon's dome is supported by 28 ribs. It is compositionally similar to the Rio Tinto wheel. Its diameter is 7 M (14 *cubiti*) which makes its circumference 28 M(5,5 *cubiti*) long.

Compositionally, the BHWM with its 28 spokes is analogous to the Rio Tinto wheel or to the Pantheon's dome.

The Panteheon's dome models the platonic universe from the *Republic*. Its opening on the top transmits the pillar of light. Its ribs liken the chains of light stretching from the heaven. The dome itself is the cosmic vault.

Illustration 3.

„My benefactor then ... pointed out to me that numbers three and seven are the basis of everything" wrote Pierre Besouhoff in his diary (Book six, chapter VIII in Tolstoy's *War and Peace*).

The number three means all triangular numbers; the number seven are all heptagonal numbers and their gnomons. From the point of view of the BHMW composition, the triangular number of 10 pebbles, called *tetractys*, and the heptagonal number of 7 pebbles together with its gnomon of 11 pebbles are important.

The ratio 10:7 approximates $\sqrt{2}$ and the ratio 11 : 7 approximates $\pi : 2$. Both ratios are found in the BHMW composition.

Illustration 4.

The wheel-window of Saint Saviour in Dubrovnik has 14 spokes. Its diameter equals 7 modules of 14 *digiti*; its circumference is consequently 14 modules of 22 *digiti*:

$(14 \times 22) : (7 \times 14) \sim \pi$.

One *cubitus* of Dubrovnik, composed of 28 digiti, is slightly shorter than the original *cubitus longus* composed of 7 *palmi*.

Division of a circle in 14 or 28 sectors is always possible when one seventh of the circle's diameter is divisible in 7 or 14 parts.

This wheel-window is a copy of the platonic Cosmos. Its central *oculus* is the source of light imitating the Plato's column of light. Its spokes imitate light bonding together the great whorl.

The division of a circle in 28 intervals was a standard modular procedure. It is first alluded to by Anaximandros in his description of the sun. According to him, the sun is similar to a wheel emitting light from its empty middle, projecting rays to its perimeter. The sun is a circle, twenty-eight times as large as the earth. The analogy between the Anaximandros' sun and the universe described by Plato in the Republic is evident.

Illustration 5.

The diameter of the roof of the Shakers' Round Stone Barn is 7 modules of 14 ft long. The roof's circumference equals 28 modules of 11 ft:

$(28 \times 11) : (7 \times 14) \sim \pi$.

The Shakers' Round Stone Barn is a model of the universe. Its central lantern lets in the light which is similar to the Plato's column of light in his universe described in the *Republic*. Its radially arranged rafters symbolize the bonds of heaven hol ding together the orbits of the universe.

Illustration 6.

The Round Table at Winchester is about 9 modules of 2 ft in diameter. Its circumference is around 56 ft, or 28 modules of 2 ft. In other words, it is designed for 28 sitters. It was made in the XII century and it was first painted in the spoke pattern of 24 alternating bands in Tudor colours by Henry VIII in XVI century, when the original number of knights recruited by Merlin was obviously forgotten.

The ratio of the Winchester Table 28:9 equal to 3, 1, is closer to π, than the ratio 29:9, equal to 3,2, of the Avebury's NNW circle.

Illustration 7.

Merlin was asked to find men to complete the company at the Round Table. He recruited 28 knights, a reminiscence on the modular division of a circle in 28 parts, which is interesting from our point of view.

The remainder of the Round Table story is the history of π approximation. The Table's three sieges remaining void, reserved for the men „of most worship", mean that only in special cases a cirlcle can be divided in 29, 30, and 31 modules, but not if circle's diameter equals 10 modules. The Siege Perilous could only be occupied by the young prince Galahad, which means that the 32nd siege must be narrower than other seats. It can be taken only by a slightly built youngster, needing only 0,4 widht of a normal place.

Artist's view of the Round Table with its 28 knights, three seiges void, and the Siege Perilous for Galahad, by Marjan Amalietti.

Illustration 8.

The plan for a baptistery by Leonardo on the octagram's grid is a copy of the universe described in the *Republic*. Its central baptismal fountain is the socket for the pillar of light, ist eight peripheral chapels echo the eight Syrens. Both, the geocentric cosmos of the *Republic* and the heliocentrik cosmos modelled in the Atlantis by Critias, are based on octogram, described by Plato in the *Timaeus* as the soul of the universe.

Illustration 9.

The platonic soul of the universe, composed of „the same", of „the other", and of „the third being, intermediate between the two", is a good description of the scheme of octagram, composed of circles, of squares, and of octagons, which are in between. Geometrical proportions originating in octagram and rationally approximated with the ratios of Pell terms, and the lambda numbers said by Plato to be responsible for the world's order, are recognizable as „the reason and intelligence" in the *Timaeus*.

Illustration 10.

Numbers of stades, given by Critias for diameters of the Atlantis, are scattered across the Pell number pattern. They can be found with the aid of the platonic lambda numbers, i.e.

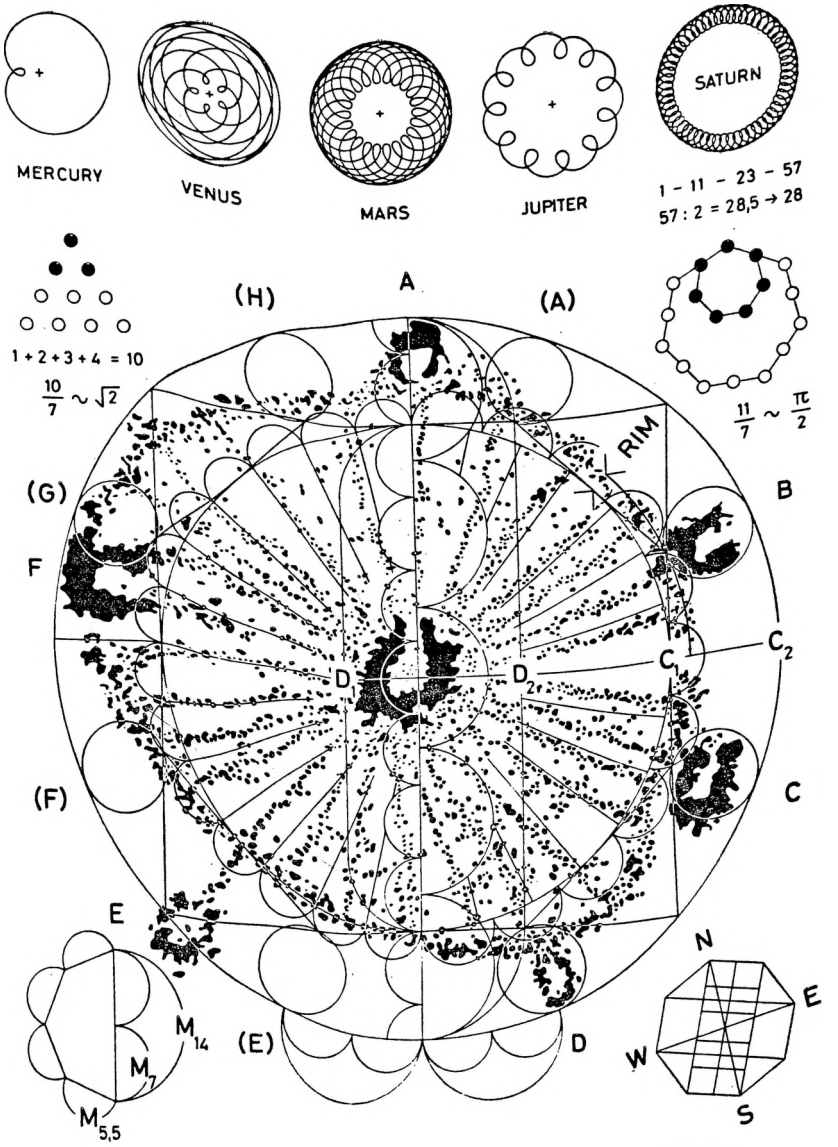
1
2 3
4 9
8 27, in their figured form. Numerically, radii of the Atlantis rings after Critias in 0,5 stades can be compared to orbital radii in 10^7 km, if the stade equals 600 northern ft, or 0,201 km.

Octagram and Pell numbers are common to both, to the heliocentric unverse of *Critias* and *Timaeus* and to the geocentric universe of *Republic*.

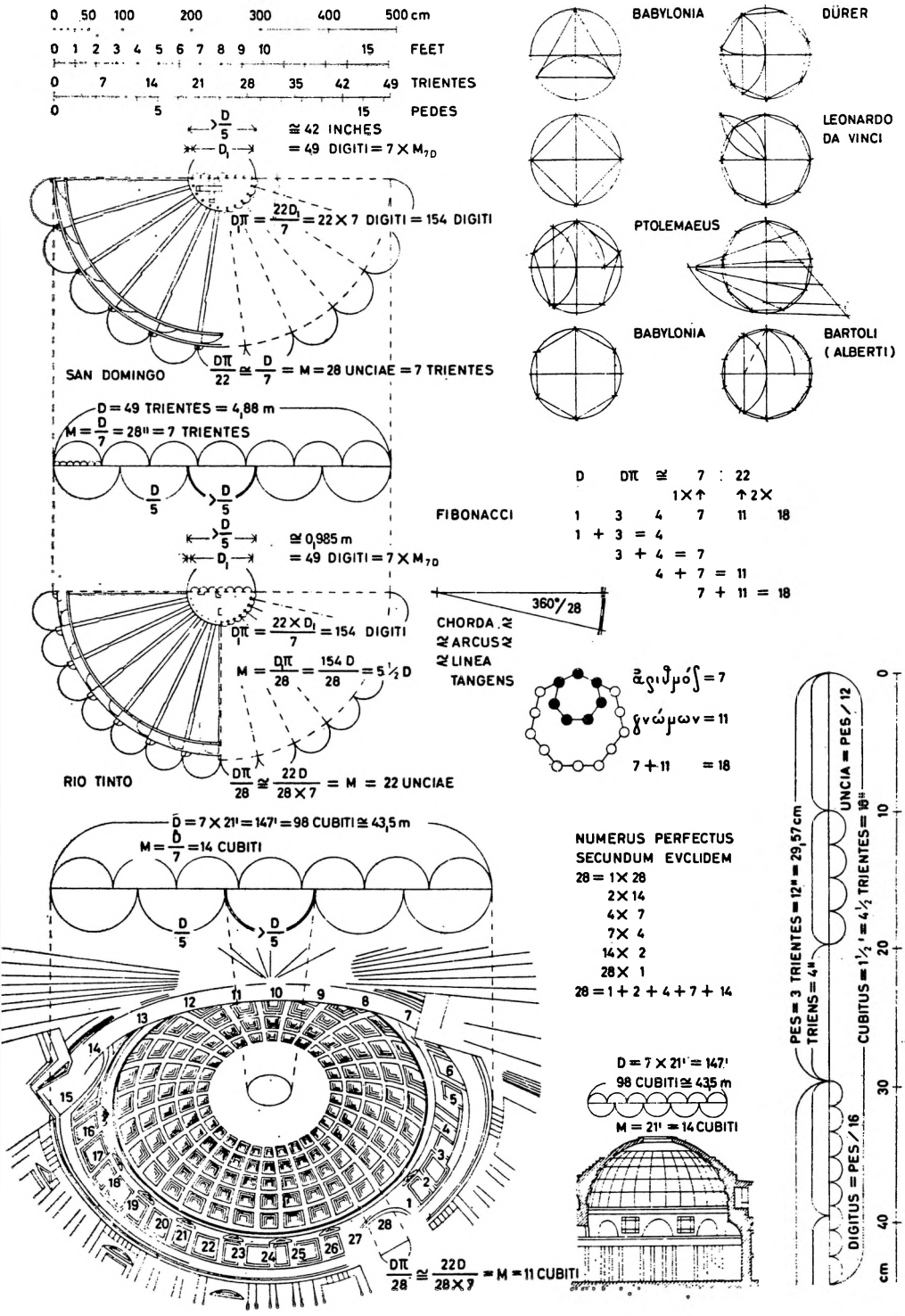
Illustration 11.

Artist's view of the platonic Cosmos in the *Republic*. The pillar of light, bound to the great whorl sitting the eight Syrens, is supported by Necessity with her three daughters.

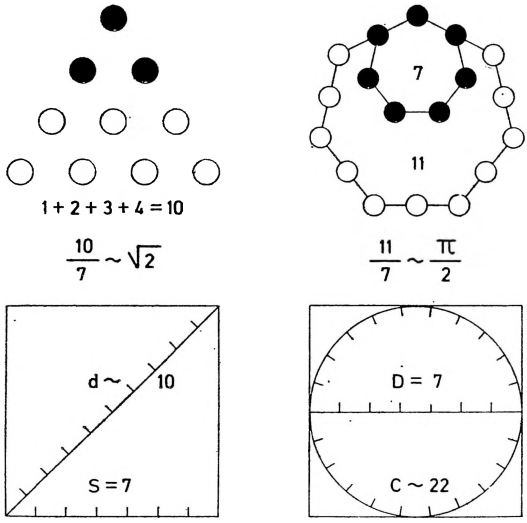
Drawing by Marjan Amalietti.


MERCURY
VENUS
MARS
JUPITER
SATURN
1 - 11 - 23 - 57
57 : 2 = 28,5 → 28
1 + 2 + 3 + 4 = 10
10/7 ~ √2
11/7 ~ π/2
(H)
A
(A)
RIM
(G)
B
F
C2
C1
D1
D2
(F)
C
E
N
E
W
S
M14
M7
M5,5
(E)
D
MODULES
M (14 units)
M (7 units)
M (5,5 units)
PELL SERIES
5/2 ~ 12/5 ~ 29/12 ~ θ = 1 + √2
D1 = 7M (7 units) , C2 ~ 22M (7 units) = 28M (5,5 units)
D2 = 10M (7 units) , C2 ~ 32M (7 units)
D1 : D2 ~ 1 : √2
C1 : D1 ~ 22 : 7 ~ π
C2 : D2 ~ 32 : 10 ~ π
1 unit = 33,5 cm
0 10 20 30 units
0' 10' 20' 30'
0 10 20 30 units
0 1 2 3 4 5 10m

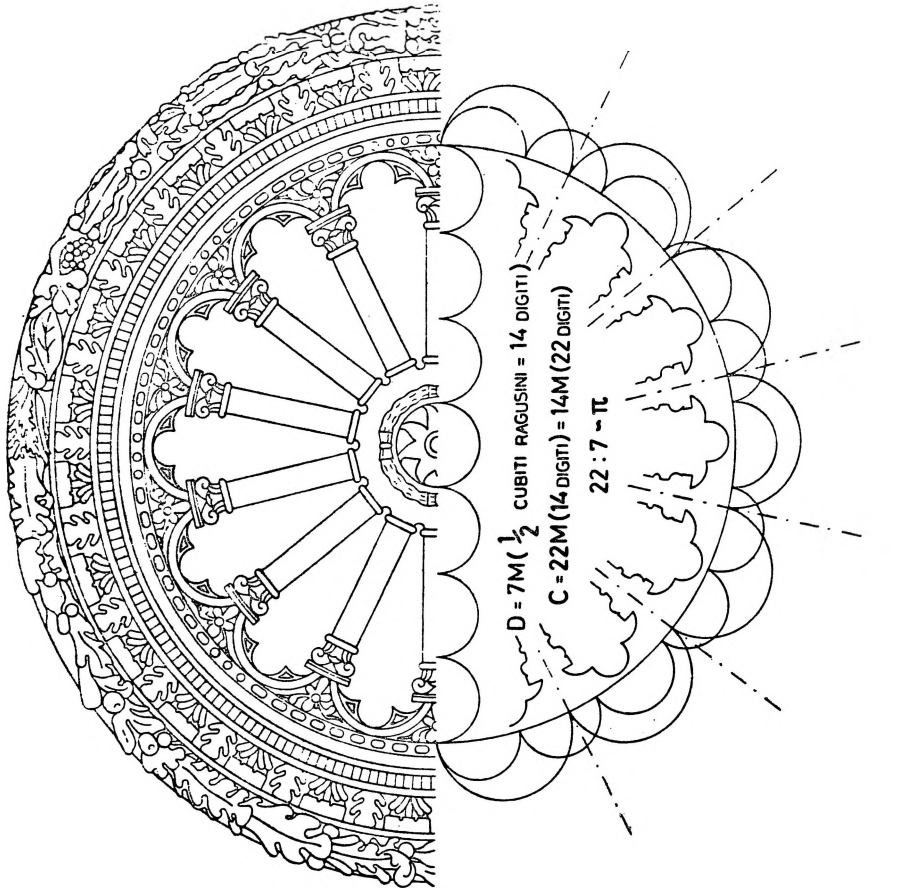
Illustr. 1

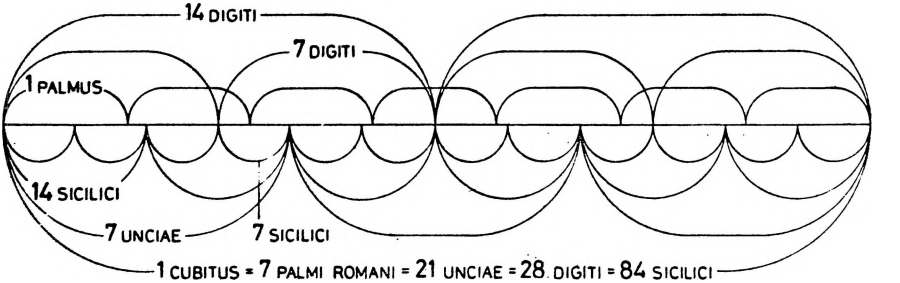

0 50 100 200 300 400 500 cm
0 1 2 3 4 5 6 7 8 9 10 15 FEET
0 7 14 21 28 35 42 49 TRIENTES
0 5 15 PEDES
D/5 ≅ 42 INCHES
D1 = 49 DIGITI = 7 × M7D
Dπ = 22D1/7 = 22 × 7 DIGITI = 154 DIGITI
Dπ/22 ≅ D/7 = M = 28 UNCIAE = 7 TRIENTES
SAN DOMINGO
D = 49 TRIENTES = 4,88 m
M = D/7 = 28'' = 7 TRIENTES
D/5 D/5
D/5 ≅ 0,985 m
D1 = 49 DIGITI = 7 × M7D
Dπ = 22 × D1/7 = 154 DIGITI
M = Dπ/28 = 154 D/28 = 5½ D
Dπ/28 ≅ 22D/28 × 7 = M = 22 UNCIAE
RIO TINTO
D = 7 × 21' = 147' = 98 CUBITI ≅ 43,5 m
M = D/7 = 14 CUBITI
D/5 D/5
Dπ/28 ≅ 22D/28 × 7 = M = 11 CUBITI
BABYLONIA
DÜRER
LEONARDO DA VINCI
PTOLEMAEUS
BABYLONIA
BARTOLI (ALBERTI)
FIBONACCI
D Dπ ≅ 7 : 22
1 × ↑ ↑ 2 ×
1 3 4 7 11 18
1 + 3 = 4
3 + 4 = 7
4 + 7 = 11
7 + 11 = 18
360°/28
CHORDA ≅ ARCUS ≅ LINEA TANGENS
ἀριθμός = 7
γνώμων = 11
7 + 11 = 18
NUMERUS PERFECTUS SECUNDUM EVCLIDEM
28 = 1 × 28
2 × 14
4 × 7
7 × 4
14 × 2
28 × 1
28 = 1 + 2 + 4 + 7 + 14
D = 7 × 21' = 147'
98 CUBITI ≅ 43,5 m
M = 21' = 14 CUBITI
PES = 3 TRIENTES = 12'' = 29,57 cm
TRIENS = 4''
UNCIA = PES/12
CUBITUS = 1½' = 4½ TRIENTES = 18''
DIGITUS = PES/16
cm
0 10 20 30 40

Illustr. 2



Illustr. 3





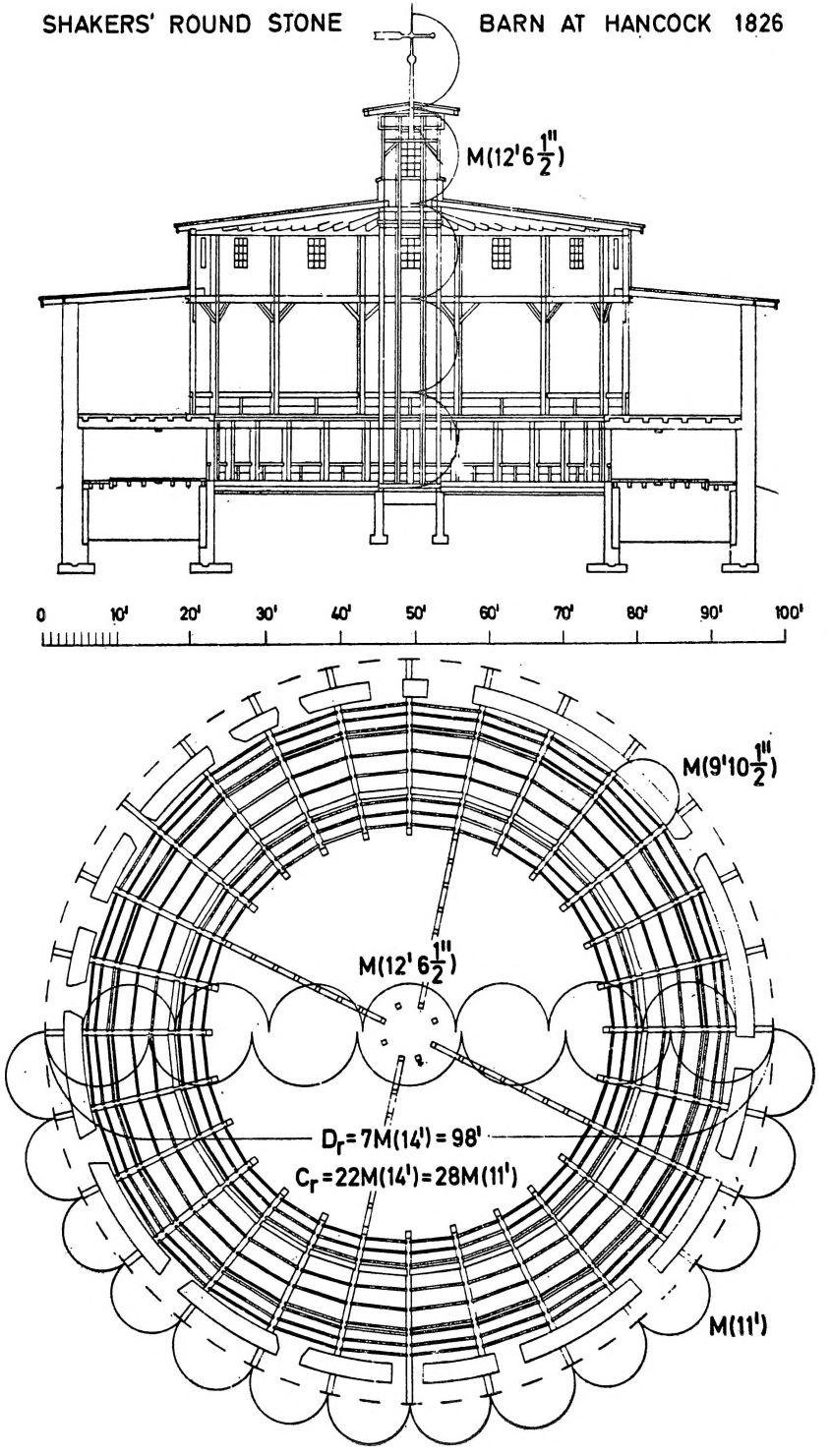
1 CUBITUS RAGUSINUS = 51,255998 cm

7 PALMI ROMANI 7×7,39 cm = 51,73 cm

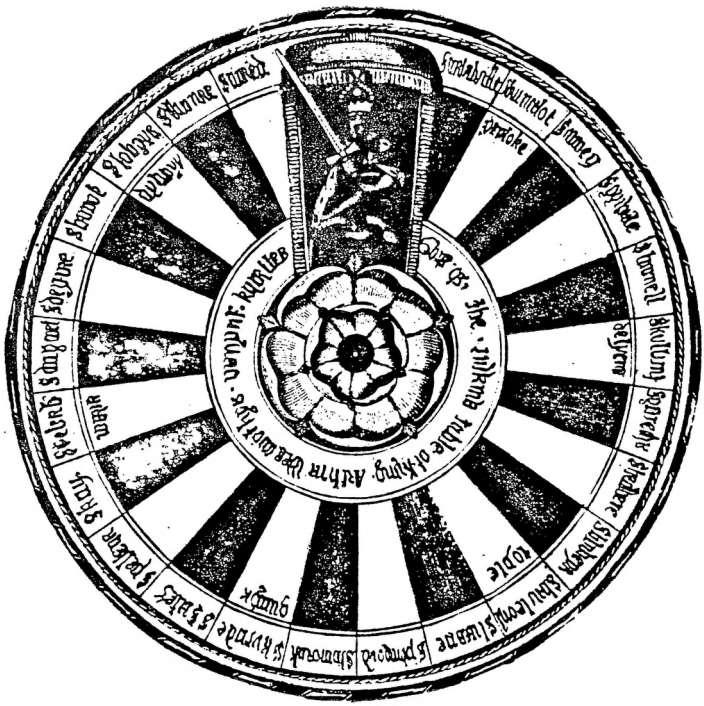
Δ = 0,474 cm

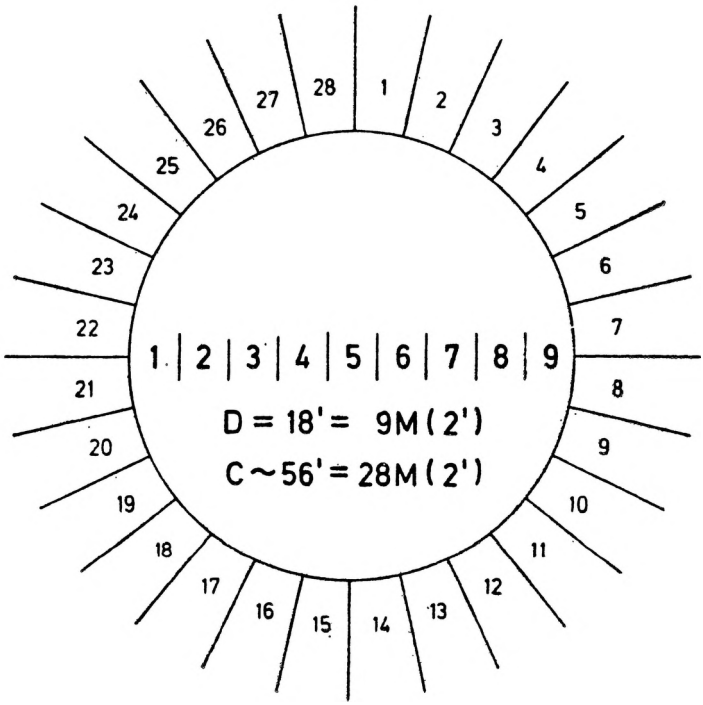
WHEEL WINDOW ON THE CHURCH SV. SPAS (ST. SAVIOUR) IN DUBROVNIK, DALMATIA, BUILT IN 1520-1528 BY PETAR ANDRIJIĆ

Illustr. 4

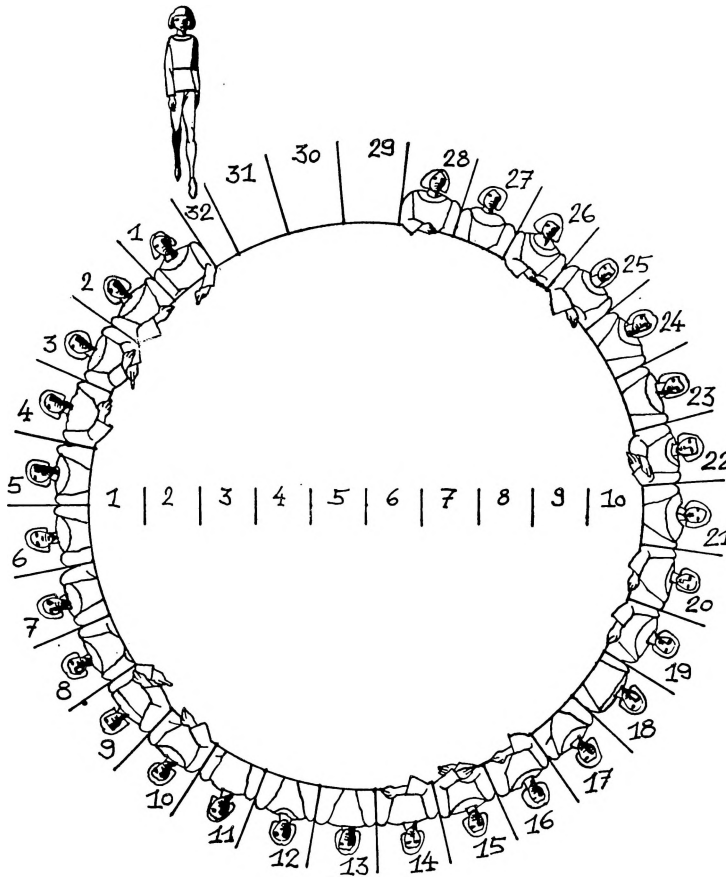

SHAKERS' ROUND STONE BARN AT HANCOCK 1826
M(12'6 1/2")
0 10' 20' 30' 40' 50' 60' 70' 80' 90' 100'
M(9'10 1/2")
M(12'6 1/2")
D_r = 7M(14') = 98'
C_r = 22M(14') = 28M(11')
M(11')

Illustr. 5

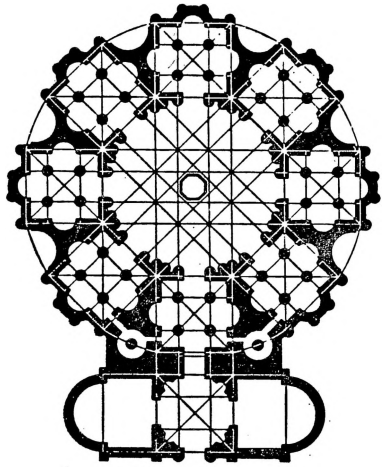




Illustr. 6


1 2 3 4 5 6 7 8 9 10
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32

Illustr. 7

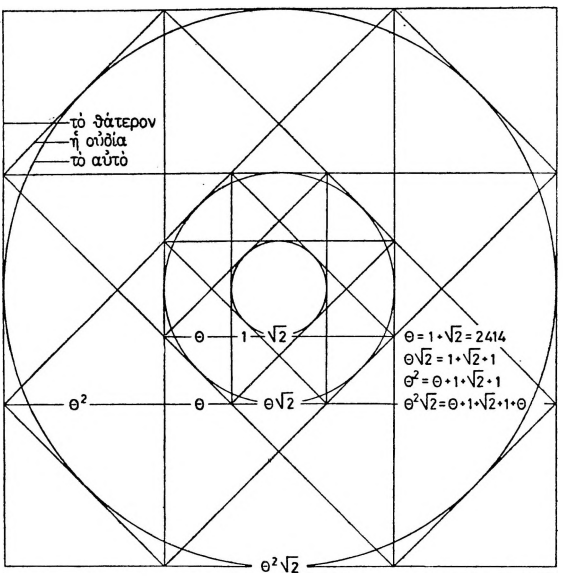


PLAN FOR A BAPTISTERIUM AND ITS OCTAGRAM
AFTER A DRAWING BY LEONARDO DA VINCI.
(BIBLOTHÈQUE NATIONALE PARIS MS 2037)

Illustr. 8

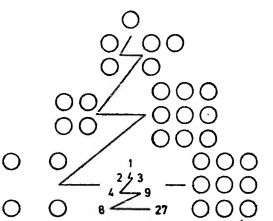
ἡ τοῦ παντὸς ψυχή (Timaeus 41d)

ἡ ψυχή (Timaeus 34b) = τὸ αὐτὸ (35a) + τὸ θάτερον (35a) + ἡ οὐδία (35b)

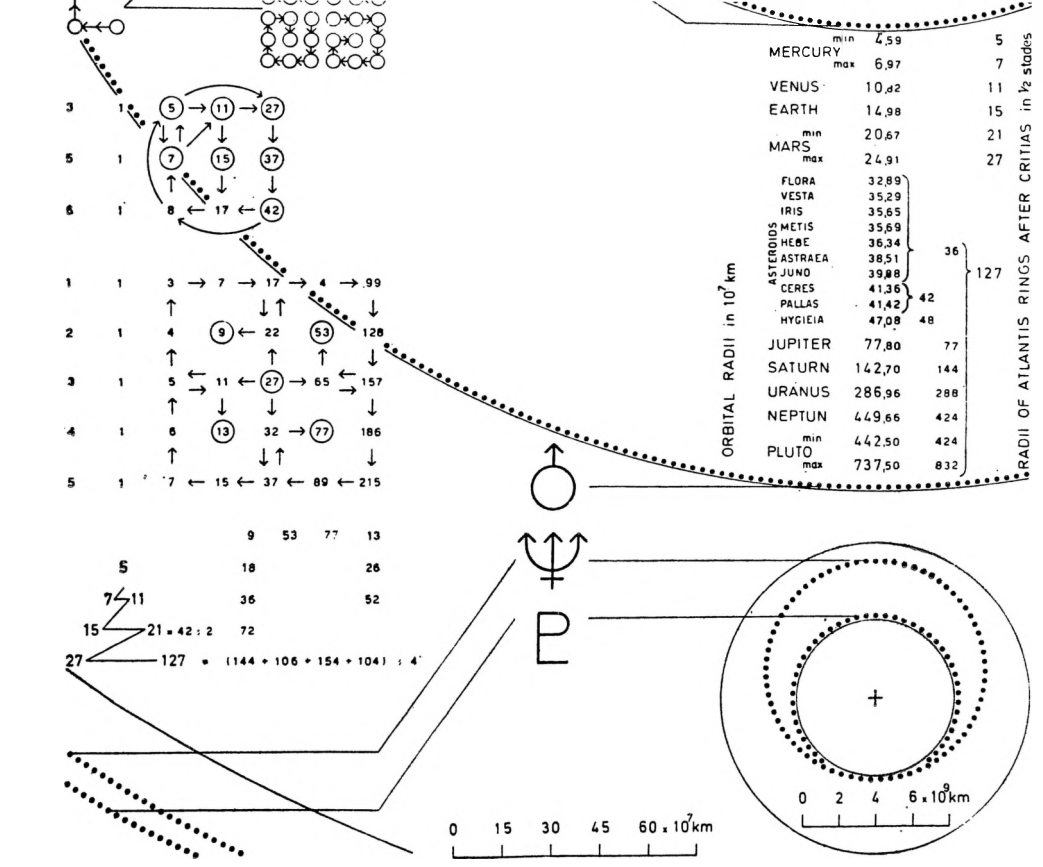


ὁ νοῦς καὶ ἡ φρόνησις (Timaeus 34a)

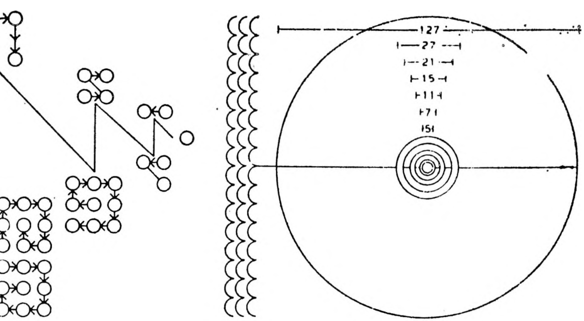
0 - 1 - 2 - 5 - 12 - 29 - 70 - 169 - ...
1 - 1 - 3 - 7 - 17 - 41 - 99 - 239 - ...
2 - 1 - 4 - 9 - 22 - 53 - 128 - 309 - ...
3 - 1 - 5 - 11 - 27 - 65 - 157 - 379 - ...
4 - 1 - 6 - 13 - 32 - 77 - 186 - 449 - ...
5 - 1 - 7 - 15 - 37 - 89 - 215 - 519 - ...
6 - 1 - 8 - 17 - 42 - 101 - 244 - 589 - ...
7 - 1 - 9 - 19 - 47 - 113 - 273 - 659 - ...
8 - 1 - 10 - 21 - 52 - 125 - 302 - 729 - ...

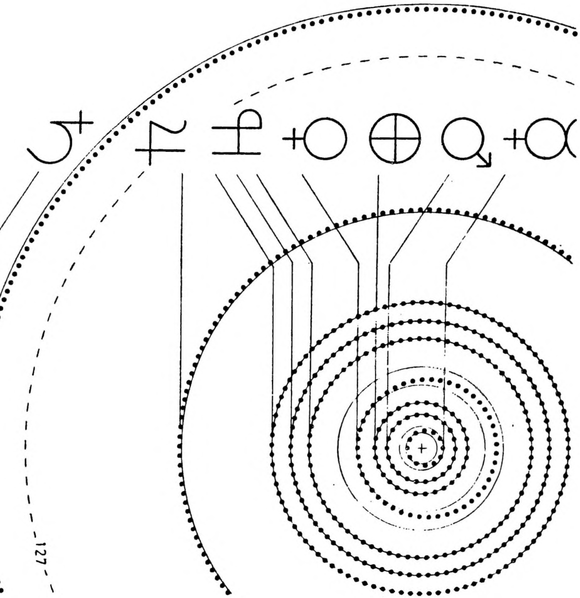


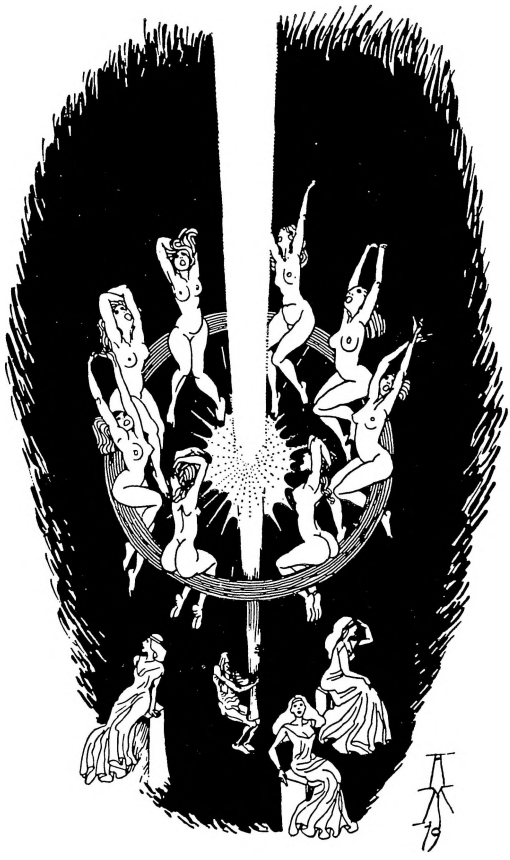
Illustr. 9


ORBITAL RADII in 10^7 km
MERCURY min 4,59 max 6,97
VENUS 10,82
EARTH 14,98
MARS min 20,67 max 24,91
ASTEROIDS
FLORA 32,89
VESTA 35,29
IRIS 35,65
METIS 35,69
HEBE 36,34
ASTRAEA 38,51
JUNO 39,88
CERES 41,36
PALLAS 41,42
HYGIEIA 47,08
JUPITER 77,80
SATURN 142,70
URANUS 286,96
NEPTUN 449,66
PLUTO min 442,50 max 737,50
RADII OF ATLANTIS RINGS AFTER CRITIAS in ½ stades
5
7
11
15
21
27
36
42
48
77
144
288
424
424
832
127
3 1 5 → 11 → 27
5 1 7 15 37
6 1 8 ← 17 ← 42
1 1 3 → 7 → 17 → 4 → 99
2 1 4 9 ← 22 53 128
3 1 5 11 ← 27 → 65 157
4 1 6 13 32 → 77 186
5 1 7 ← 15 ← 37 ← 89 ← 215
9 53 77 13
5 18 26
7 11 36 52
15 21 = 42 : 2 72
27 127 = (144 + 106 + 154 + 104) : 4
0 15 30 45 60 x 10^7km
0 2 4 6 x 10^9km

Illustr. 10


127
27
21
15
11
7
5


127



Illustr. 11