

THE OM MANI PADME HUM, THE PLATONIC SOUL, THE TAO, AND THE GREEK CROSS ARE AN ARCHITECTURAL TOOL

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The plan of Borobudur conforms with two concentric octagrams.¹ The lines of the scheme,² their lengths, and their intersections, determine the articulation of the Borobudur composition, i. e. the sizes of every part and of the whole as well. (See Ill. 1) The sizes of Borobudur are modular. Their modular multiples are Pell numbers,³ the ratios of which rationally approximate the irrational proportions in octagram⁴ (Ill. 2). If Borobudur numbers are located in the Pell number-pattern and connected with a line, the syllable OM, written in Sanskrit, appears.

The word octagram is only the modern European name of the symbol of OM. The prayer OM MANI PADME HUM, translated as 'the JEWEL and the LOTOS', is a good description of octagram. The jewel, i. e. a well cut brilliant with its facets, is similar to the drawing of octagram. The flower of lotos with its eight petals evokes the eight-pointed star of octagram (illustration 3).

The earliest mention of octagram is Plato's Soul of the Universe (Ill. 4). The Soul is described as the composition of 'the Same' (= the circle), of 'the Other' (= the square), and of 'the Third Form of Being, compounded out of the twain' (= the octagon).⁵ According to Plato, the Universe was shaped by Demiurge with the aid of the Soul.⁶

The Chinese TAO is analogous in shape and in its beneficence to the octagram, or to the OM.⁷

The octagram is an architectural tool.⁸ Vitruvius is referring to it with his two 'octagonal *schemata*', formed as a windrose, in his explanation how to design a town.⁹ The Roman architecture is indeed shaped with proportions generated in octagram.¹⁰ As an example, see the plan of Roman Emona,¹¹ an Augustean town under the present name of Ljubljana, Yugoslavia (Ill. 5). An analogous Egyptian example is Ikhnaton's North Palace (Ill. 6). The Egyptian hieroglyphic *niwt* — said to mean »the crossroad of a village«¹² — is a mutation of octagram, meaning the »composition, building«.¹³

The forms in octagram are shaping architectures in Eurasia. In Asia, e. g., see the plan of Peking¹⁴ and of Kyoto¹⁵ (Ill. 7 and Ill. 8). As a Byzantine example, see the Serbian church of Hilandar¹⁵, on the Athos Peninsula, Greece (Ill. 9). A fine example of Islamic architecture is a mosque of Ottoman type, the Husrev-bey mosque in Sarajevo, Yugoslavia¹⁶ (Ill. 10).

In the Middle Ages, the octagram as an architectural scheme was called »the Greek Cross«. The early Christian symbol was IHTHYS¹⁷, but the cross,

which is one of the mutations of octagram, soon substituted it. The traces of OM, AUM, AVM, AUNG, in Europe are still evident in the word AM(en) and in the involution AV(e) M(aria).

The Indian *Vastu Purusha mandala*, the *manduka mandala*, and *paramasayika mandala*,¹⁸ are the modular subdivisions of the octagram's square (Ill. 11). The number of pada, determining the length of the mandala, is a specific Pell term.

The conclusion of my paper is that the scheme of octagram, under which the symbol of OM is known, is shaping the historical architecture of the Old World. It is evident in Egyptian, Roman, Byzantine, Moslem, Hindu, Chinese, Japanese, and Buddhist architectures. Apparently its origin is in Asia.

NOTES

¹ T. Kurent, *Symbols in Shapes and Sizes of Borobudur*, Paper read at the II. Congress of Indonesian Architects, *Persatuan Sarjana Arsitektur Indonesia*, January 1986, Jakarta.

² Or *les tracés régulateurs*, if we may borrow the term from Le Corbusier.

³ John Pell, 1610—1685, English mathematician who first published the series, now named after him.

⁴ The mathematical aspect of octagram and Pell series is described by P. H. Scholfield, *The Theory of Proportion in Architecture*, Cambridge, At the University Press, 1958.

⁵ Plato, *Timaeus*, 35 A.

⁶ T. Kurent, Stonehenge and the Vitruvian Amusium, *Architectural Association Quarterly*, vol. 7, no. 3, 1975.

T. Kurent, Atlantis after Critias and the Numbers of the Platonic Lambda, *Antiquité Vivante* (Skopje) XXIX, 1, 1979.

T. Kurent, The architectural Models of the Platonic Cosmos, Described in the Republic, *Antiquité Vivante*, XXX, 1—2, 1980.

T. Kurent, The Platonic Lambda is the Key to the Stonehenge Composition, *Antiquité Vivante*, XXIX, 1, 1979.

⁷ cf. *The I Ching or the Book of Changes*, Routledge and Kegan Paul, London (Translation).

Lao Tsu, *Tao Te Ching*, Wildwood House Ltd, London, 1975, (Translation).

⁸ See T. Kurent, Cosmogramma della Basilica Romanica di Stična. — *Critica d'arte*, XLV, 174, 1980.

⁹ Vitruvius, *De architectura*, Liber I., Caput VI.

¹⁰ T. Kurent, The Modular Composition of Diocletian Palace in Split, *Antiquité Vivante* XX, 1970.

T. Kurent, The Modular Analogy of Roman Palaces in Split and Fishbourne, *Archaeometry*, 12/1, 1980.

T. Kurent, The Analogy in Modular Composition of Roman Fortresses at Caerleon and at Mogorjelo, *Antiquité Vivante* XXI, 2, 1971.

T. Kurent, Silchester, the Vitruvian Octagonal Town, *Antiquité Vivante* XXII, 1972.

T. Kurent, La composition modulaire de la ville Romaine de Lambaesis, *Antiquité Vivante* XXIV, 1—2.

¹¹ M. Detoni, Kurent T., *The Modular Reconstruction of Emona*, Dissertationes Musei Nationalis Labacensis, Ljubljana, 1963.

J. Šašel, Emona, *Paulys Realencyclopädie der Classischen Altertumswissenschaft*. Supplementband XI, 1968.

¹² According to A. Gardiner, *Egyptian Grammar*, Oxford University Press.

¹³ T. Kurent, Oktagram in hieroglif, ki pomeni naselje, *Sinteza* (Ljubljana, Yugoslavia) 49, 1980.

¹⁴ T. Kurent, Cosmogramma della basilica romanica di Stična, *Critica d'arte* XLV, 174, 1980; (In this paper, numerous examples are illustrated.)

¹⁵ T. Kurent, La coordinacion modular de las dimensiones arquitectonicas, *Boletín del Museo Arqueológico Nacional* (Madrid), III, 1985; (Numerous examples).

¹⁶ T. Kurent, *Brojevi Tolstojevih prostozidara tri i sedam u modularnoj arhitektonskoj kompoziciji*, Arhitektonski fakultet Univerziteta u Beogradu, Beograd, 1981; (Examples).

¹⁷ The Greek word IHTHYS, meaning 'fish' is an acronym of appellation Iesous Xrystos Theou Yos Soter.

¹⁸ Wolwahren, *Inde Bouddhique, Hindou et Jaina*, Office du Livre, Fribourg (Suisse), 1968.

ILLUSTRATIONS

1. The plan of Borobudur based on two concentric octagrams. The modular multiples in sizes of octagram's lines are Pell terms. If connected with a line, the Sanskrit form of the syllable OM appears.

2. The scheme of octagram and its proportions.

3. OM MANI PADME HUM. The brilliant resembles the scheme of octagram and the lotos flower is similar to the eight-pointed star of octagram.

4. Plato's Soul of the Universe, consisting of the Same, of the Other, and of the third Being, is the octagram's scheme.

5. The Roman Emona is in the proportion, called *quadriagon*.

6. The plan of the North Palace in Tell-El-Amarnah is a *quadriagon*, rationally approximated with the ratio 5:4.

7. The plan of Peking is in the octagram's proportions.

8. The plan of Kyoto is in the ratio 7:6, which is an approximation of *quadriagon*.

9. The Byzantine church of Hilandar, Athos, is designed with the aid of an octagram.

10. The Husrev-Bey mosque in Sarajevo, Yugoslavia, is designed with the aid of an octagram.

11. The modular subdivision of Indian architectural mandalas is a combination of the octagram's square and of the Pell numbers.

12. The planning grid for the groundfloor of the church in Bogojina, Slovenia, by Jože Plečnik implies the Greek cross, analogous to the Indian *paramasayika mandala* or Vastu Purusha mandala (See Ills, 11. and 15.).

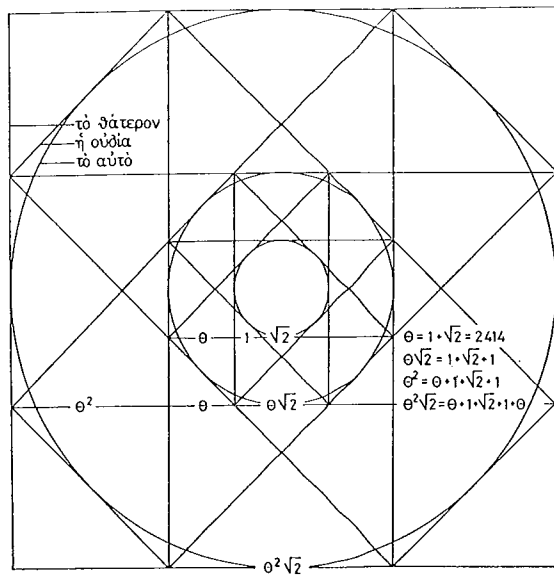
13. The Temple, as described by Ezekiel, is conforming with the octagram of the first Pell series: 1 — 2 — 5 — 12 — ...

14. The Greek Cross on the groundplane of Michelangelo's St. Peter in Rome.

15. The Indian Vastu Purusha mandala, or *paramasayika mandala*.

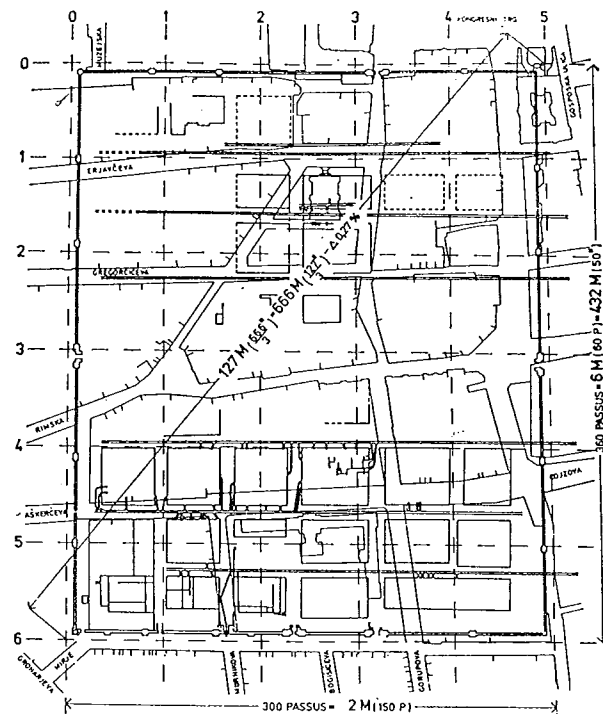
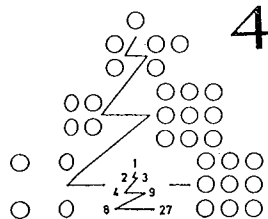
16. The metamorphoses of octagram: the Egyptian hieroglyphic NIWT, the early cross in catacombs, the Vitruvian wind-rose, the symbol of Rosy-crucians, the Indian Shri Yantra, the OM Yantra, the Indo-Chinese mandala, the TAO.

ἡ ψυχὴ (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	-	...



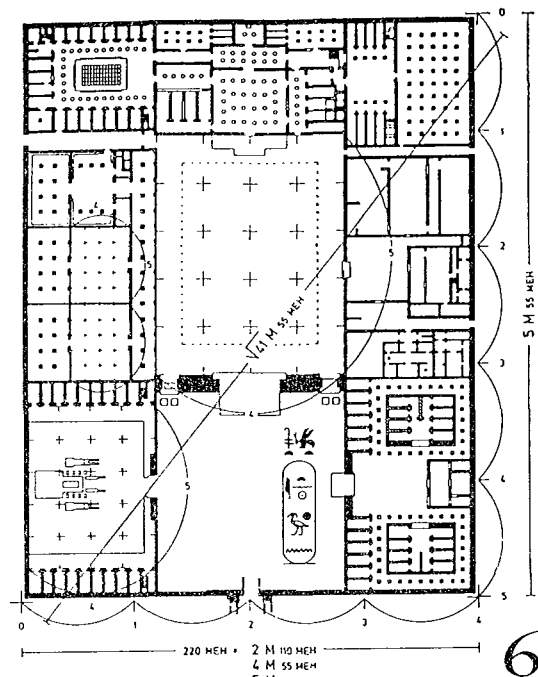
A horizontal scale bar representing 150 meters, with major tick marks at 0, 50, 100, and 150 m. A bracket below the scale indicates that the first 100 meters are designated as 'MIX PASSUS' and the remaining 50 meters are designated as 'C PASSUS'.

PELL SERIES
 $1 - 2 - \textcircled{5} - 12 - \dots \rightarrow \frac{\sqrt{2+1}}{2}$
 $\frac{1}{2} - 1 - 2\frac{1}{2} - \textcircled{6} - \dots$

5M(60 P)
6M(50 P)
10M(30 P)
12M(25 P)
100M(3 P)
532M(45 digiti
+ Δ 0,25 %)
EMONA 1st C. A.D.

EMONA 1st CAD

TURRUM MURORUMQUE FUNDAMENTA SIC SUNT FACIENDA, UTI FODIANTUR, SI QUEAT INVENIRI,
AD SOLIDUM ET IN SOLIDO, QUANTUM EX AMPLITUDINE OPERIS PRO RATIONE VIDEATUR, CRASSI
TUDINE AMPLIORE QUAM PARIETUM, QUI SUPRA TEPHAM SUNT FUTURI, ET EA IMPLANTANTUR LVS
SOLIDISSIMA STRUCTURA VITRUVII DE ARCHITECTURA - LIB. 1/5

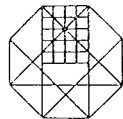


MODULES

- M 55 CUBITS
- M 275 CUBITS
- M 15 CUBITS
- M 7 CUBITS

EURHYTHMY

1 - 2 - 5 - 12 - 29 → 1im 8/2
2 - 4 - 10 - 24 - 58

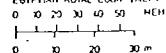


PROPORTION

5:4 (QUADRAGON)

$$\frac{5}{4} \sim \frac{12}{10} \sim \frac{29}{24} \sim \frac{8}{2} \sim \frac{\sqrt{2} \cdot 1}{2} \sim 1,797 \sim \frac{5}{4} \sim 1,250$$

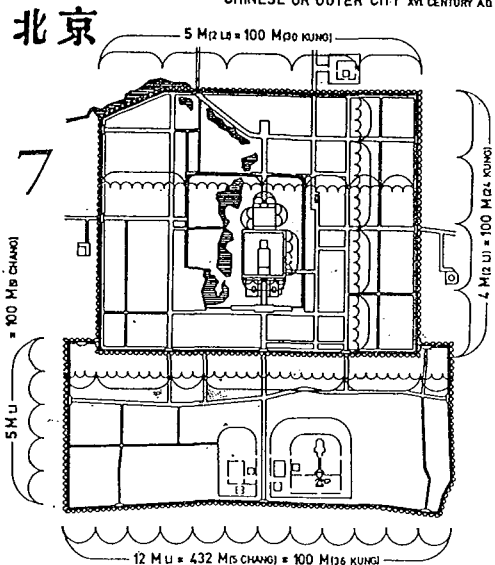
EGYPTIAN ROYAL CUBIT (MEH) = 52,4 cm



EGYPTIAN HIEROGLYPHIC OF VILLAGE OR CITY

TELL-EL-AMARNAH THE NORTH PALACE (1370-1352 B.C.)

PEKING, CAPITAL OF CHINA: TARTAR OR INNER CITY XIV CENTURY AD
CHINESE OR OUTER CITY XVI CENTURY AD



MODULES



LI ~ 680 m

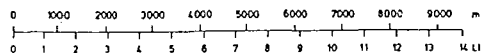
M 2 LI = 2 M LI = 6 M 100 CHANG = 6 M 100 KUNG = 18 M 100 CHANG

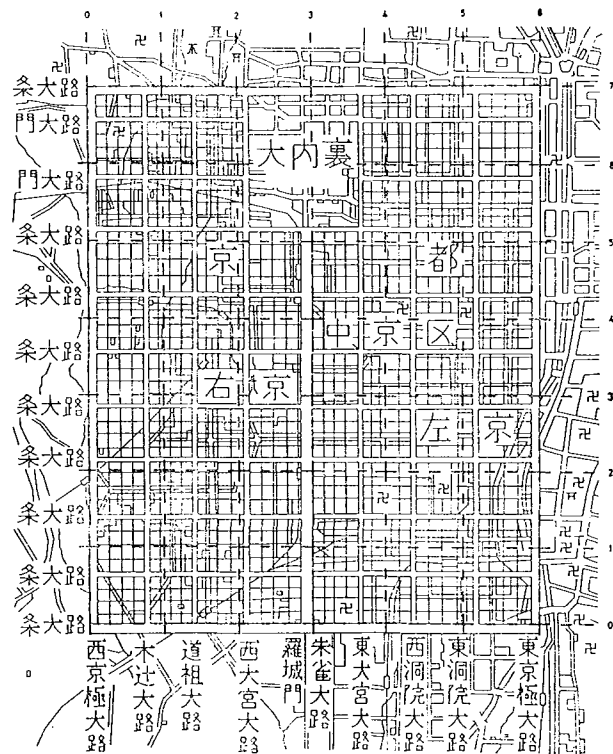
PROPORTION 1:1 PRIMA 5:4 QUADRAGON 12:5 DOUBLE QUADRAGON



EURHYTHMY

1 - 2 - 5 - 12 - 29 → 1im 8/2
2 - 4 - 10 - 24 - 58





MODULE



XYOTO, VIII CENTURY A.D.

EURHYTHMY

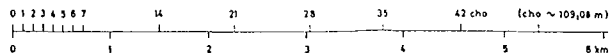
1-3-①-17 → 8 $\frac{H}{2}$ = 1207 ~ 1187

PROPORTION

7:6 QUADRIGON



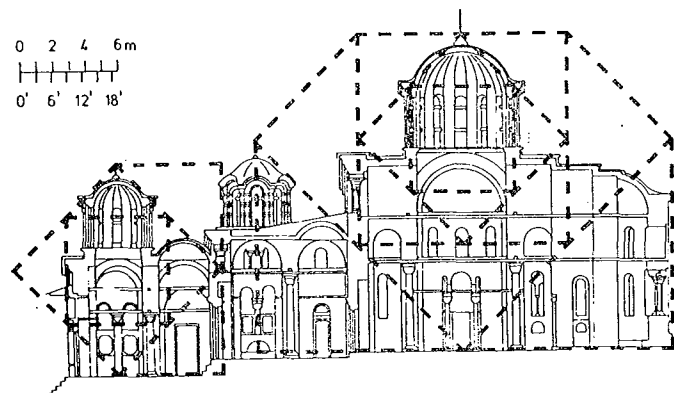
8



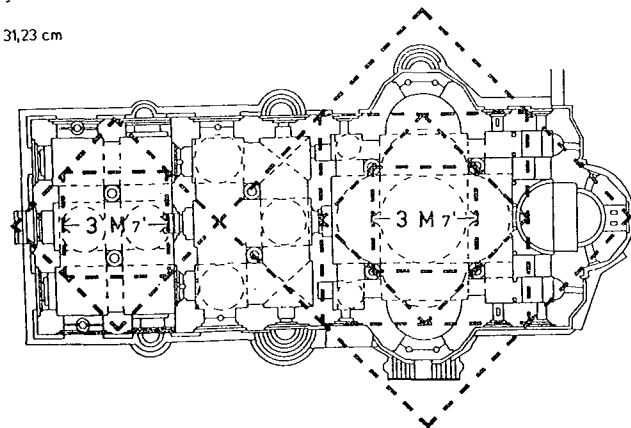
ХИЛАНДАР

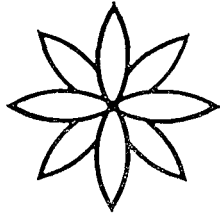
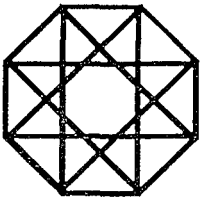
9

0 2 4 6 m
0' 6' 12' 18'



1' = 31,23 cm

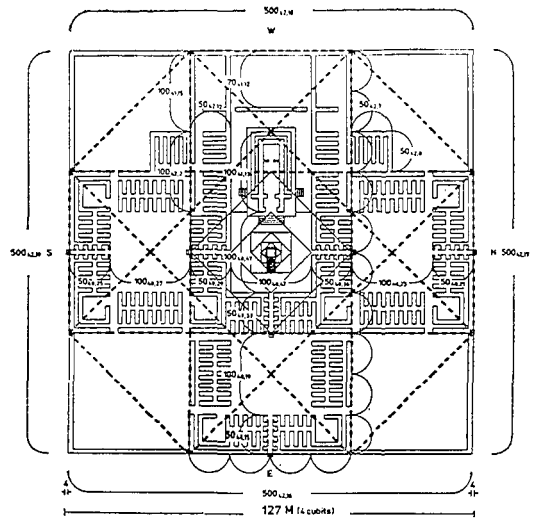




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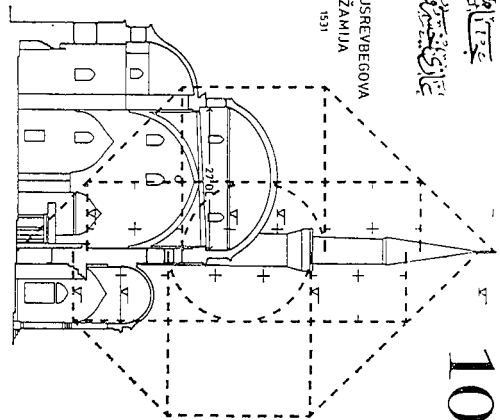
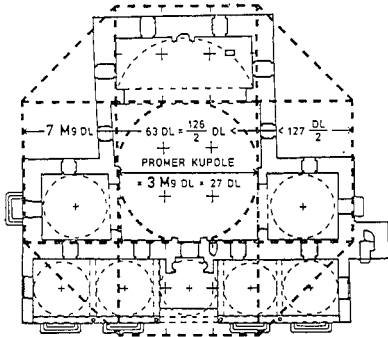
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मंताय नमः मंताय नमः

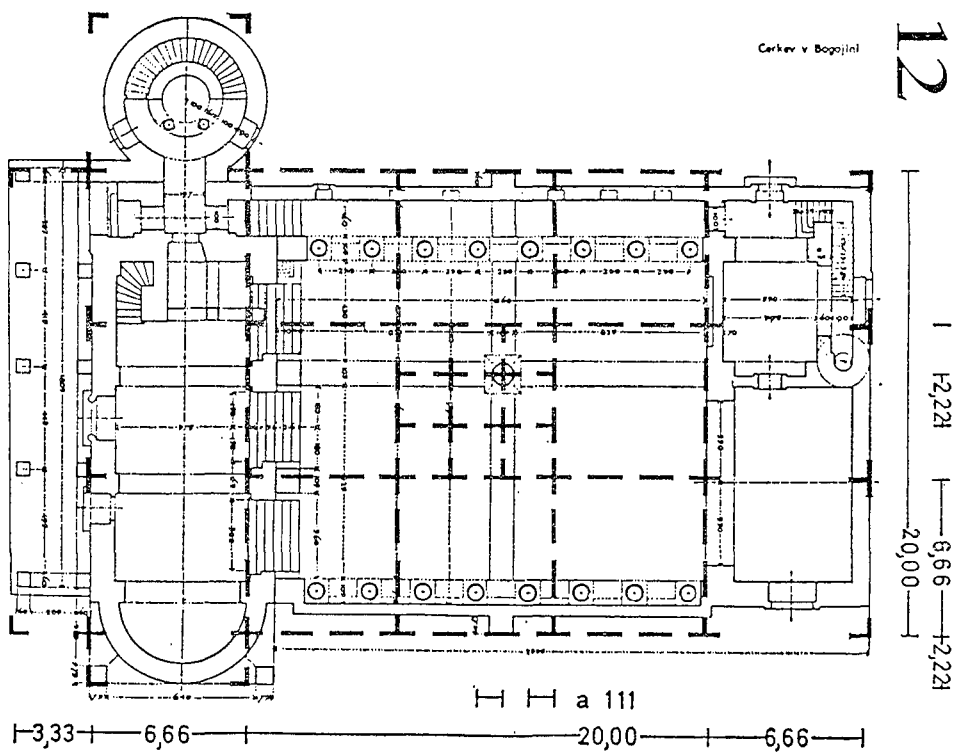
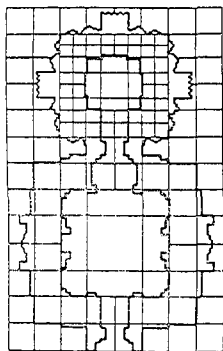
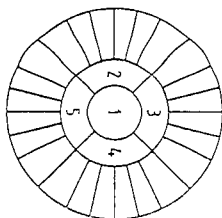
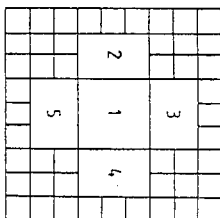
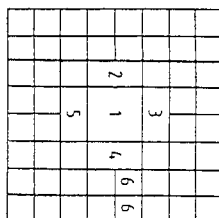


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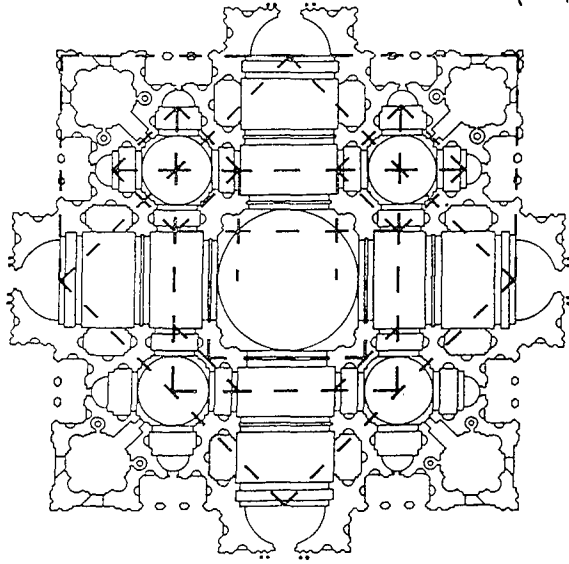
±Ms DL ± PELLOV NIZ 1 3 7 17
DUBROVAČKI LAKAT ± 0.512559 m



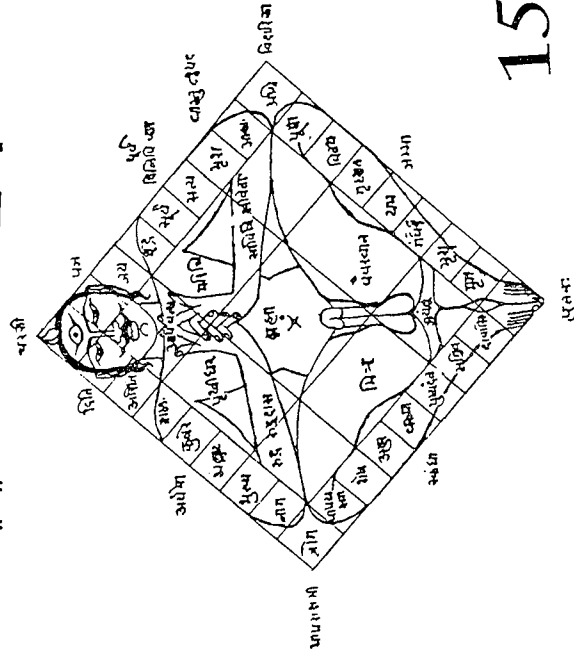
10

TEMPELJ BRAHMESHVARA
V BHUBANESWARUVASTU PURUSHA
MANDALAPARAMASAYIKA
MANDALAMANDUKA
MANDALA

- 1 BRAHMA
- 2 ARYAMA
- 3 PRITHVIDHARA
- 4 MITRA
- 5 VIVASVAN
- 6 PROSTOR ZA
ZUNANE BOGOVE



14



15



16

