AN ARCHAIC CORONA PIECE AT HISTRIA

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1. The item under study in this paper is a two-piece reconstituted corner fragment of a yellowish Babadag limestone corona (L 430)[1]. The pieces corresponding to two façades have concave middle surfaces that broaden to the upper side where they are topped by flat register 5 cm high. The corner edge where the two façades intersect also appears slightly expanding to the upper side. The lower side of the item consists of a 2.1 cm-high register likewise broadening but downward. The façades, intersecting at an angle (α) of about 70° ($69.9° \leqslant \alpha \leqslant 70°$), show traces of a painted decoration (Fig. 1).

The concave areas make up a sort of "cavetto" decorated with overchanging leaves or petals sensibly rounded upwards. Small lanceolate leaves are interspersed, where the curves originate. The leaves are rendered by a contour ± 1.1 cm wide. The contour of the corner palm is also visible. The lighter yellowish shades of the leaf contours and smaller lanceolate leaves stand out against the present dark reddish shade of the bakground. The color shades of the original decoration might have been altered by a fire of which some random reddish spots on the lower surface seem to bear evidence.

The decoration's original outline — particularly its vertical axes — is still visible as very finely incised lines.

Besides the value of the façade intersection angle (α), another peculiar feature of the item's construction is that the façades appear to be asymmetrical with respect to the bisectrix of this angle. Thus, on the façade of which a larger fragment has been preserved, the "cavetto" concavity appears to be much deeper (and the resulting upward expansion larger) than on the other profound façade. On the former façade, apart from the corner half-leaf, three further leaves and part of a fourth one, as well as the four "arrows" interspersed, have been presevecd. On the shallow concavity façade, the corner half-leaf is followed by three leaves plus three and a half smaller pointed leaves. The medium vertical axes of the marginal arrow-leaves are partly made apparent by outline incisions that extend in part over the two flat horizontal lintels of each façade. The upper one probably consisted of two painted stripes as it can be deduced from the presence of a finely incised horizontal line which divides into two parts this surface of the façade, but the painting itself is fully deteriorated.

Traces of a crafty *anathirosis* with a marked frame can be identified on the lower surface. The core fragment preserved exhibits fractions of two right-angle intersecting lines, one of which is parallel to the longer side of the lower surface. The corresponding *anathirosis* frame is ± 12.2 cm wide. Core excavation is very small (± 0.15 cm). Two finely incised lines can still be noticed on the lower surface, paralleling its longer side, then coming out on the lower lintel of the shallow concavity façade. Compared to the decoration, they may be regarded as a previous marking, but they are likely to have served other purposes as well. The two incisions intersect the corresponding lower surface edge at distances of ± 9.80 cm and ± 15.9 cm, respectively, from the corner of that surface (Fig. 1).

The upper surface is mostly deteriorated, even so traces of a smooth frame, 3 cm and 3.5 cm wide, respectively, are still visible along the edges. Chisel marks can be noticed on the remaining upper side.

A small triangular protuberance damaged at the top is noticed in the corner area. This nose-like bulge which seems to have been slightly bent inwards, extends over ± 8.2 cm on each side of the upper surface, and traces of a similar protuberance, more damaged still, are seen at the shorter side and, opposite the corner.

[1] The item discovered west from Zeus's Temple in a bothros of Greek "sacred zone" at Histria in 1963 (G. Bordenache, Materiale, 9, 1970, p. 184).

DACIA, N.S., tome XXXV, Bucarest, 1991, p. 93—101

OVERALL DIMENSIONS:

— length of the conserved shorter side of upper surface: ±33.3 cm
— "cavetto" height: 11.5 cm.
— overall height (without the bulges): 18.6 cm

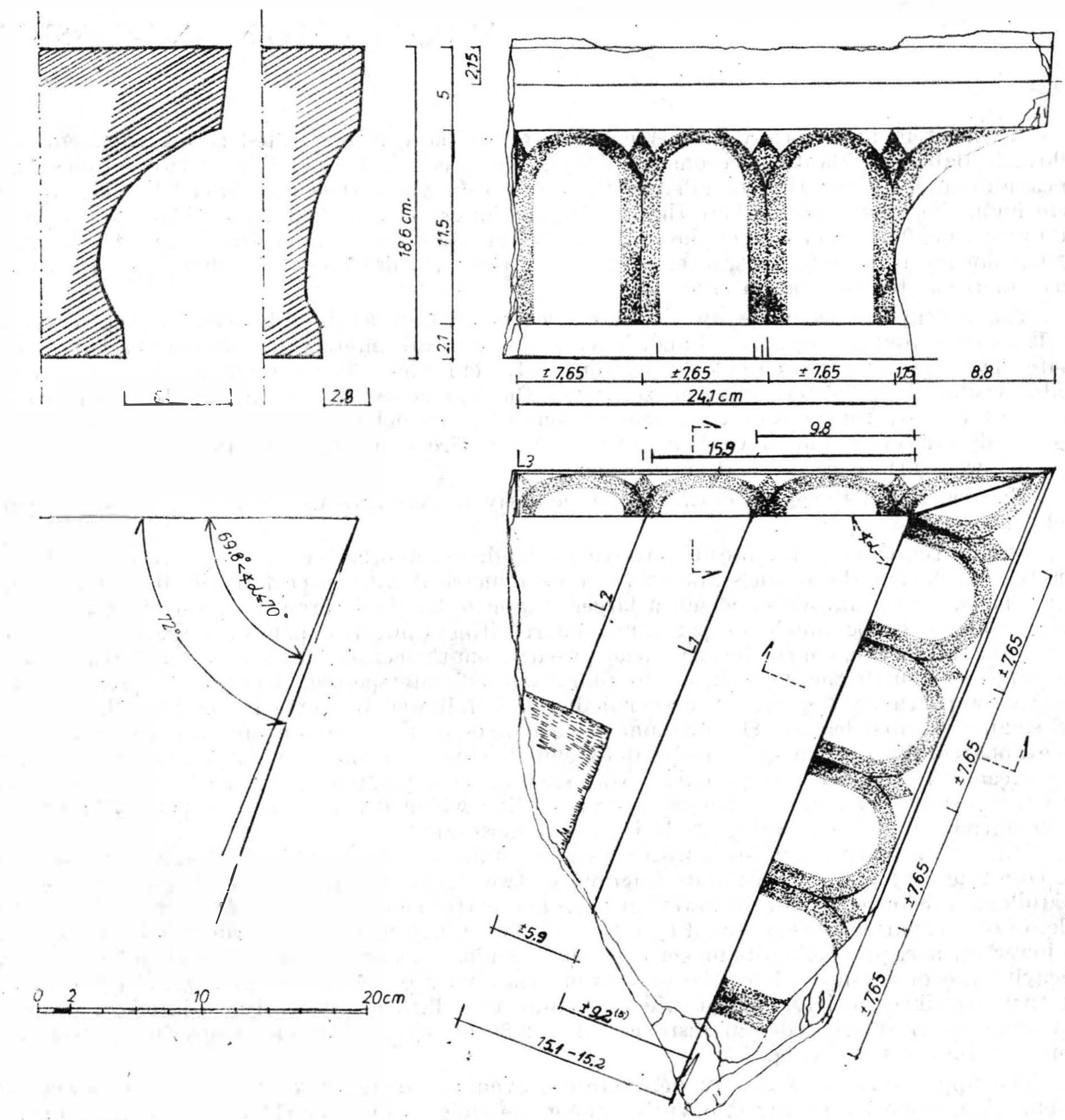

Fig. 1. — Fragment L_{430}.

— upper section height: 5 cm
— lower lintel height: 2.1 cm
— height of the two subsections of the upper section as divided by the incised line: 2.15 cm and 2.85 cm
— interaxis of the small arrow-shaped leaves: ±7.65 cm
— total width of the perimetric belt adjacent to the leaves: 2.15 cm
— length of the shorter side of lower surface (as measured up to the vertical axis of last left-hand arrow): 24.1 cm
— length of the conserved longer side of lower surface: ±32 cm.

2. From a stylistical viewpoint, the only hint to a possible dating of the item is the sequence of large leaves whose roundedness excludes any pointed tendency. From this point of view the item may be traced back probably to the second half of the 6th ct. B.C. This chronological assumption is supported by two lines of analogies. The first one includes elements of the above type exclusively painted and decorating architectural components, like those painted on archaic simae and akroterion, e.g. the Epidamnos treasure sima [2] (±525 B.C.) or the disk-akroterion at Larissa on the Hermos [3]

The second category consists of relief leaves, including egg-shaped leaves which formally (in their vertical projection) differ from the Histria item under investigation only in their upside-down position — a fact which does not quite relate to style, but rather to the particular bend of surfaces they decorate, and naturally to the place they take in the architectural structure they belong to. We thus note a possible analogy between the curvature of Histria leaves and that of other leaves on friezes or teracotta simae at Olbia [4] and Larissa on the Hermos [5], Olimpia or Sardes [6], and egg-shaped leaves as carved on the Kymation of the capital I in Gela [7], the "ovolo" of the old Didymaion friza and last but not least the sculpture elements characterizing the palm-capital from the treasury of Massalia (Delphi) [8].

Very significant are also possible analogies at Histria itself. Account taken of nothing but the terminal curvature and the shape of the intermediate lanceolate leaves, the contour outline on our item resembles that of contour projection of "ovolo" on the geison ceramic plates (which however appear flatter) dating from "somewhere around the mid-sixth century" [9]. Formally, an even more sensible similarity (including lanceolate leaves) can be established with the sculpture decoration — event through overturned (since not on a concave surface) — on the upper frieze of a Histria tripod-bowl dating from the third quarter of the 6th ct. B.C. [10]. However, the curvature of the leaves of the L 430 Histrian piece seems to be more evolved.

If we accept the hypothetical dating 6th ct. B.C., then for the construction of the monument to which our item belonged, a *terminus ante quem* is that of the Scythian raids which ruined Histrya in the late 6th ct. B.C. [11].

However, the type of anathirosis noticeable on the lower surface with a ±12.2 cm average width frame paralleling the longer side does not contradict, in our opinion, its chronological integration perhaps in the late 6th century, but rather in the next century [12]. (We come back to this problem later)

3. *MEASURING UNIT*. Of course, this problem can only be approached as a hypothesis, since all of the item's main necessary dimensions have not been preserved. Yet besides the vertical dimensions which are complete, we shall also take into account the fine incisions that are left as well as the structure elements of the decoration that make up a uniform rhythm.

(a) 1 F = ±35 cm ; 1 d = ±2.187 cm

(1) Overall height = 18.6 cm = 8 1/2 d (error : 0.01 cm)

(2) Lower section height = 2.1 cm = 1 d (error : 0.08 cm)

(3) Upper section height as marker by horizontal incision = 2.15 cm =1 d (error : 0.03 cm)

(4) Upward expansion = ±6.4 cm = 3 d (error : 0.16 cm)

(5) Lower surface short side length up to the last vertical incision = 24.1 cm = 11 d (error : 0.04 cm)

(6) Interaxial spacing of leaves and arrows = ±7.65 cm = 3 1/2 d (error : 0.00 cm)

(7) Upper section incision spacing from corner : = 9.80 cm = 4 1/2 d (error : 0.04 cm) and 15.9 cm = 7 1/4 d (error : 0.05 cm)

[2] A. Mallwizz, *Olympia und seine Bauten*, München. 1972, p. 170, fig. 130.

[3] A. Akerström, *Die Architektonischen Terakotten Kleinasiens*, Lund, 1966, t. 20, fig. 1.

[4] *Ibidem*, table 1, fig. 1.

[5] *Ibidem*, table 19, fig. 1; table 20, fig. 3; table 22, fig. 2; table 23, fig. 1; table 25; table 26, fig. 1.

[6] *Ibidem*, Table 49, fig. 1—3; N. Yalouris, *Olympie, l'Altis et le Musée*, Athenes, 1972, fig. 14, 15. The curvature of the Histrian leaves is siqnificantly more elaborate than in any of the examples cited in notes 3—6 and 7—10 above.

[7] G. Gruben, *Die tempel der Griechen*, München, 1966/1967, p. 363, fig. 299; D. Theodorescu, *Chapiteaux ioniques de la Sicile Méridionale*, Naples, 1974, p. 12; see also P. Amandry, *La Colonne des Naxiens et le Portique des Athéniens*, in *Fouilles de Delphes*, II, Paris, 1953, pl. XI, XVI; W. B. Dinsmoor, *The Architecture of ancient Greece*, London—New York—Sydney, 1950, p. 143, fig. 53, pl. XXXIII in Athens, Delos and Delphi).

[8] W. B. Dinsmoor, *op. cit.*, p. 138, pl. XXXIII; J. Coulton, *The Architectural Development of the Greek Stoa*, Oxford, 1976, p. 121—123, fig. 31 a; see also painted ceramic fragments of archaic sima and acroterions from a treasury at Olympia (see V. N. Yalouris, *op. cit.*, figs. 14, 15).

[9] D. Theodorescu, Révue Arghéologique, 1, 1976, p. 32—33, figs. 4, 5; K. Zimmermann, Xenia, 25, 1990, p. 173, fig. 15.

[10] K. Zimmermann, P. Alexandrescu, Dacia, N.S., 24, 1980, p. 271—274, fig. 3.

[11] *Ibidem*.

[12] R. Martin, *Manuel d'architecture grecque*, I, Paris, 1965, p. 196 for anathiroses dating from the late 6th c. B.C. and the beginning of the 5th ct. B.C.

(b) 1 F = ±32.8 cm ; 1 d = 2.05 cm
(1) 18.6 cm = 9 d (error : 0.15 cm)
(2) 2.1 cm = 1 d (error : 0.05 cm)
(3) 2.15 cm = 1 d (error : 0.10 cm)
(4) 6.4 cm = 3 d (error : 0.25 cm)
(5) 24.1 cm = 11 3/4 d (error : 0.00 cm)
(6) 7.65 cm = 3 3/4 d (error : 0.03 cm)
(7) 9.8 cm = 4 3/4 d (error : 0.06 cm)
15.9 cm = 7 3/4 d (error : 0.02 cm)

(c) 1 F = 29.4 cm ; 1 d = 1.837 cm
(1) 18.6 cm = 10 d (error : 0.23 cm)
(2) 2.1 cm = 1 d (error : 0.36 cm)
(3) 2.15 cm = 1 d (error : 0.31 cm)
(4) 6.4 cm = 3 1/2 d (error : 0.03 cm)
(5) 24.1 cm = 13 d (error : 0.22 cm)
(6) 7.65 cm = 4 d (error : 0.30 cm)
(7) 9.8 cm = 5 1/3 d (error : 0.05 cm)
15.9 cm = 8 2/3 d (error : 0.18 cm).

Considering error levels and the dimensions in which fine incisions (entries 3, 5) and decoration drawing elements (6) and lines traced on the lower surface (7) are involved, we can assume that an Ionic foot, i.e. 34.9—35 cm, might have been used (See also section 6)

4. *DESTINATION*. The volumetric features of this fragment of a Histrian corona are a serious drawback in our attempts to determine its place in a potential building. The major difficulty lies in the "strange" value of the angle of the two façades, which particular intersection angle would suggest the item did not belong to a bulding, but were rather the ornamental corona (or higher section of a corona) of a separate monument, be it a funerary one (a stela?), a memorial or a votive monument. To support this hypothesis, one might cite, as a formal suggestion, a number of funerary monuments outlined on Greek pots, even though some of them such as those painted by Choephoroi [13], belong to later chronological sequences, while others belong to earlier ones [14].

Some useful hints to a possible location of the item may be derived from well-known-even archaic-monuments, such as on archaic stela dating from around 540 B.C. [15], and particularly the funerary stela-pillars at Montforte del Cid and Coy (late 6th and 4th centuries B.C.) [16].

The fact that the item was discovered precisely in the sacred area, very close to the temple, can give an additional clue as to the type of monument it may have belonged. As a result, we assume this to be rather a votive monument (or perhaps a support for an ex-voto). The formal hints from earlier cited funerary monuments are found to hold in the case of a pillar-monument.

On the other hand, the planimetrics of a votive monument, whether of a punctual overall structure, or covering a larger area (including a more or less extended support depending on the architectural design, which depends in turn on the type on the crowning votive or memorial elements, such as one on several sculptural groups or various other ex-votos) may take different geometric shapes, such as round or square ones (columns, pillars) [17], up to more special configurations, either triangular or rectangular ones (simple, L-shaped, etc.) [18].

The fact that we do not seem to have right-now any direct analogy of a configuration governed by an angle of ≈ 70° cannot rule out the possibility that the Histrian item had topped a votive monument. As will be pointed out below, some simple geometric shapes can be imagined that would generally agree with the formal types described above.

[13] A. D. Trendall, T. B. L. Webster, *Illustrations of Greek Drama*, London, 1971, p. 42, fig. III—1—5 and p. 43, fig. III—1—4 (pots of the 4th ct. B.C.).

[14] Ernst Pfuhl, *Malerei und Zeichnung der Griechen*, III, München, 1923, p. 212; P. E. Arias — M. Hirmer, *Mille anni di ceramica greca*, 1960, fig. 189 (for the 5th ct. B.C.).

[15] J. Charbonneaux, R. Martin, P. Villard, *Grèce archaïque*, Paris, 1968, p. 153.

[16] Martin Almagro-Gorbea, *Arquitectura y sociedad en la cultura iberica*, in *Architecture et société de l'archaïsme grec à la fin de la république romaine*, Paris—Rome, 1983, p. 392, fig. 2.

[17] The Naxian Column at Delphi, probably votive monuments of Challimachos, Alkymachos, or Ptolemaic at the lates (W. Hoepfner, AthMitt, 1, 1974; P. Amandry. *op. cit.*).

[18] E. g. the triangular Messenian pillars, the Tarentian ex-voto stands, the Argian and Athenian memorials, the Beotian and Knydian votive monuments, the acanthus column with a dancer, and others, all of them in Delphi (the designs of which can be derived from G. Gruben, *Die Tempel der Griechen*, München, 1966, p. 70—71, or even the triangular column bearing Paionios Nike at Olympia (see N. Yalouris, *op. cit.*, fig. 8). For votive statue stands, see also the Genelaos and Myron's stand at Samos (see H. Kyrieleis, *Führer durch das Heraion von Samos*, Athen, 1981, p. 123—125; 129—130).

5. *RECONSTITUTION OF THE CORONA TYPE.* We obviously lack the necessary arguments for a dimensional reconstitution, the original size of the monument and that of its corona being an open question. As for the shape of the corona, this can be approached in terms of a few simple geometric forms from among which we prefer those whose planimetric design exhibits a "minimal symmetry", even though other possibilites cannot be ruled out.

(a) The first possible variant relies on a triangular shape coresponding to the corona (Fig. 2 parts 3 and 4). The triangle on which the design may have been based was necessarily an isosceles one with its two basal angles equaling $\sphericalangle \alpha = \pm 70°$.

Naturally, one can admit in principle that the top angle of the triangle be that same $\sphericalangle \alpha$. But the general symmetry (the only one made possible by the main height of the triangle) would be ruined in terms of the possible ways to solve the façade expansions.

Depending on the real size of the corona, this could have been made up of one piece or several joint fragments. This feature also holds for the following variants.

(b) The second variant points to a trapezoid, in fact, and isosceles trapezoid (whose basal angles would equal $\sphericalangle \alpha$) or, though less likely, a rectangular one (Fig. 2 parts 1 and 2) as the overall configuration of the corona. Taking the isosceles trapezoid case, one can figure essentially two different solutions for the façade expansion depending on the place ascribed to the corner fragment under discussions: one such solution implies three maximal expansions while the other solution, which seems more likely in our opinion, would have one single "main" façade (of maximal expansion) corresponding to the larger baseline of the trapezoid. Besides the aesthetic superiority of having one main façade with graceful and consistent curves, the latter solution also most naturally accounts for the ***anathirosis*** of the lower surface.

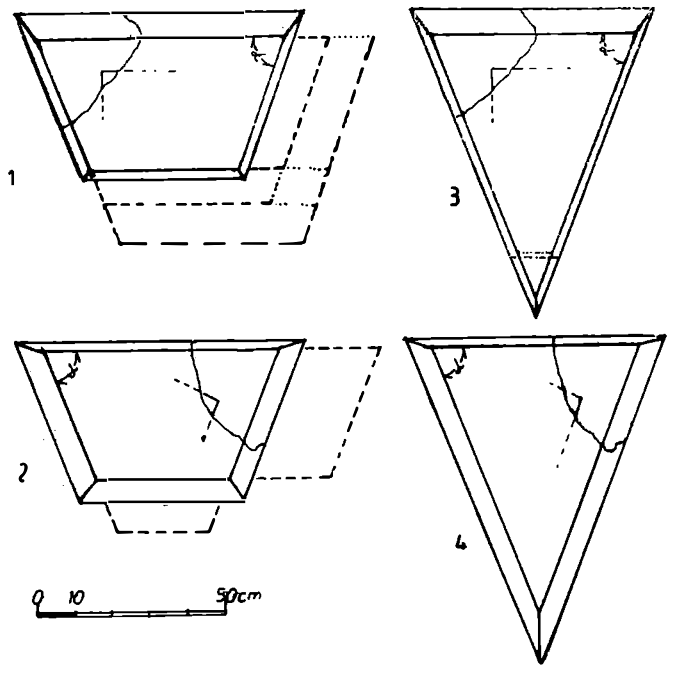

Fig. 2. — Variants for restitution.

The appearance of the trapezoidal design can be more or less flattened depending on the height.

Out of this group of trapezoidal shapes, one should consider first of all the particular case of an isosceles trapezoid the shorter base of which would equal the sides. The advantage of such design lies in its having the most ordered and regular geometry, for the lower surface, that is if we assume the underlying concept to be a most elaborate and strictly geometric one.

No matter what variant we choose, the reason for the corona façades having different expansions has yet to be explained. A first suggestion is that a greater "importance" may have been ascribed to the façade (s) showing a more elegant expansion.

In other words, this adds up to an original distinction between main and secondary façades. A further implication of it would be that the votive monument were placed so that the view should be restrained to the main façade(s) area. One can thus assume the monument were sited in quite close proximity to a building, a temple of the sacred area (perhaps even Zeus temple by which the item was uncovered), so the back sides (i.e. the façades of less lofty curves) may possibly have played a secondary role in the general view. A further explanation is called for here, namely that it is not the site that led to such façade distinction. On the contrary, it is the geometric shape resulting from the item's construction that must have prompted the siting, with the better refined façades catching the eye.

A simple analysis of the geometric formula in any of the variants described reveals that he commonest geometric solution, with façades intersecting by the bisectrices of corresponding angles, would not have resulted in identical expansions, since intersection angles were unequal to each other. Therefore, the chosen solution seems to depend exclusively on the general geometric and aesthetic conception underlying the design.

6. *A HYPOTHESIS ON THE GEOMETRIC CONCEPT UNDERLYING THE DESIGN OF THE CORONA.* The unusual value of the angle $\alpha \approx 70°$, measured on the item, calls for a few considerations on the geometric conception underlying the item's construction.

(a) Of course, the value of this angle may have been picked randomly. In this case, any further discussion is beside the point.

(b) It seems more interesting, however, to assume that the choice was determined by an elaborate conception rather than haphazard. The assumption relies on this value of $\approx 70°$, being quite close to 72°, which is not random in the least, but rather is the value of the central angle of an inscribed convex pentagon. In this case, it becomes obvious that the design of the lower surface was based on the inscribed convex pentagon and the stellate pentagon corresponding to it. In the triangular variant, the procedure could imply, as a first step, the construction of the convex and stellate pentagons, then the construction of the triangle taking one side of the convex pentagon as its base, and two of the stellate pentagon sides as triangle sides.

In the trapezoid variant, the larger base could be one of the stellate pentagon sides, while the shorter base and trapezoid sides could be convex pentagon sides (Fig. 3 part 1).

The pentagon-based construction provides a straightforward geometric explanation for the façade intersection angle that gives rise to unequal expansions. It will suffice that, in a horizontal projection of the design plane, one take as intersection lines the circle radii which act as bisectrices for the short base angles, but do not act the same for large base ones (Fig. 3,1). In other variants, both radii and pentagon diagonals (stellate pentagon sides) can be used in pairs to form the short and large bases, respectively. In any of the variants, we find a ratio, $\emptyset = 1.618$ (between the stellate pentagon side and the convex pentagon one), known as the "golden section", or in Euclid's and other Greek geometers'terms, "the division of a segment into the medium and the extreme ratio". We shall not insist at this point on the hypothetical Pythagorean origin of the pentagon construction, on the fact that the pentagram was used as a distinctive mark among Pythagoreans or, in general, on the Ancient Greeks' preoccupations related to this ratio which they regarded as a source of beauty [19].

In further support of our assumption of an elaborate design of the item, we may attempt to prove that the measured value of $\measuredangle\ \alpha$ did not arise from a mere execution error (a possibility one should not overlook nor make too much of) (Fig. 3, *2*). We shall therefore suggest a way how one can get from the ideal value (72°) to another that would be smaller by $\pm 2°$, a way that stems from the very process of carrying the design into practice. To hand down the design indications, these had to be rather simple, easily carried out, so that the actual performer should not be required to calculate the pentagon side geometrically by himself [20].

For this purpose, it would have been enough to provide the basic dimensions, i.e. the circle radius and the pentagon side (L_5). Since we don't know the radius, it will suffice for our demonstration to take the circle radius as a unit design.

So $R = 1$ unit radius $= 1$ UR. The side (L_5) can be calculated as $L_5 = 2R \sin(\alpha/2)$, hence $L_5 = 2 \times 1 \times (0.587\ldots)$ UR $= (1.175\ldots)$ UR. For practical purposes, this value has to be rounded, that is, according to Greek geometery' practice [21], to be expressed as a ratio of integers. Thus, in a 7/6 approximation, the angle can be deducted as $\sin(\alpha/2) = (7/6)/(2 \times 1)$, hence $\sin(\alpha/2) = 0.58$ so $\measuredangle\ \alpha = 70.9°$. In a 8/7 approximation, we get $\measuredangle\ \alpha = 69.69°$.

It is worth noting that the "golden section" ($\emptyset$) can be approximated as 1.629 for $\measuredangle\alpha = 70.9°$ and 1.64 for $\measuredangle\ \alpha = 69.69°$, so we are led to suppose that, for the sake of simplicity, the number was expressed as 13/8 or, though more [22] probably 25/16.

[19] Plato hints at this "golden section" (in Philebos and Timaios) but never calls it by its name as Euclid will later (see Euclid, *Elements* I, Bucarest, 1939, translation and notes by V. Marian, p. 242: *ibidem*, III, p. 150).

[20] It should be reminded that the construction of regular polygons, whether convex on stellate (whose number of sides was 5, 10, or any even multiple of five), relied on the "golden section", which mathematicians saw first of all as a mean proportional, hence easily constructed with a ruler and a caliper. Such constructions appear in Euclid's *Elements*, IV (see Euclid, *op. cit.*, p. 242).

[21] An outline of the Greeko'dealing with approximations, in Louis Frey, Revue archéologique, 2, 1990, p. 295 sqq. (including references, p. 330).

[22] The integer couples (in the series 5, 8, 13, 21) approximating the golden section can be deduced from the construction rules given in Nicomaque de Gérase; *Introduction arithmétique*, I, Paris, 1978, p. 23 (apud L. Frey, *op. cit.*).

For the 6th ct. B.C., however, we don't know of any numeric reference either for the division of a line into the medium and extreme ratio ($\emptyset$) or for 5. Similarly, we cannot tell whether they were aware of the irrationality of these numbers. We only know that the irrationality of $\sqrt{2}$ had been demonstrated by Archytas, a pupil of Philolaos who in turn had been Pythagoras most noted disciple). Besides, Theodoros of Cyrene (5 th c. B.C.) who apparently was a Pythagorean mathematician and philosopher himself, began his demonstration on irrational numbers with $\sqrt{3}$ (see Marian Ciucă, *Preliminary Notes at Theaitetos*, in Plato, *Opere*, VI, Bucarest, 1989, p. 164, 168; R. E. coll. 1812–1813; B. Mathieu, *Archytas de Tarente, Pythagoïcien et ami de Platon*, p. 239–235 (apud M. Ciucă, *op. cit.*, p. 175, n. 44).

Anyway, one doesn't have to be aware of the irrationality of $\emptyset$ or $\sqrt{5}$ to use them in a geometric construction (see note 20 above). Aproximation of such numbers through rational numbers is a non trivial operation, so it is not without interest to try to understand from an antique construction what the widely accepted approximations were.

In fact, this was precisely what we tried to do in this paper.

(For approximations in the classical Histrian period, see M. Mărgineanu – Cârstoiu, Xenia, 25, 1990, p. 114)

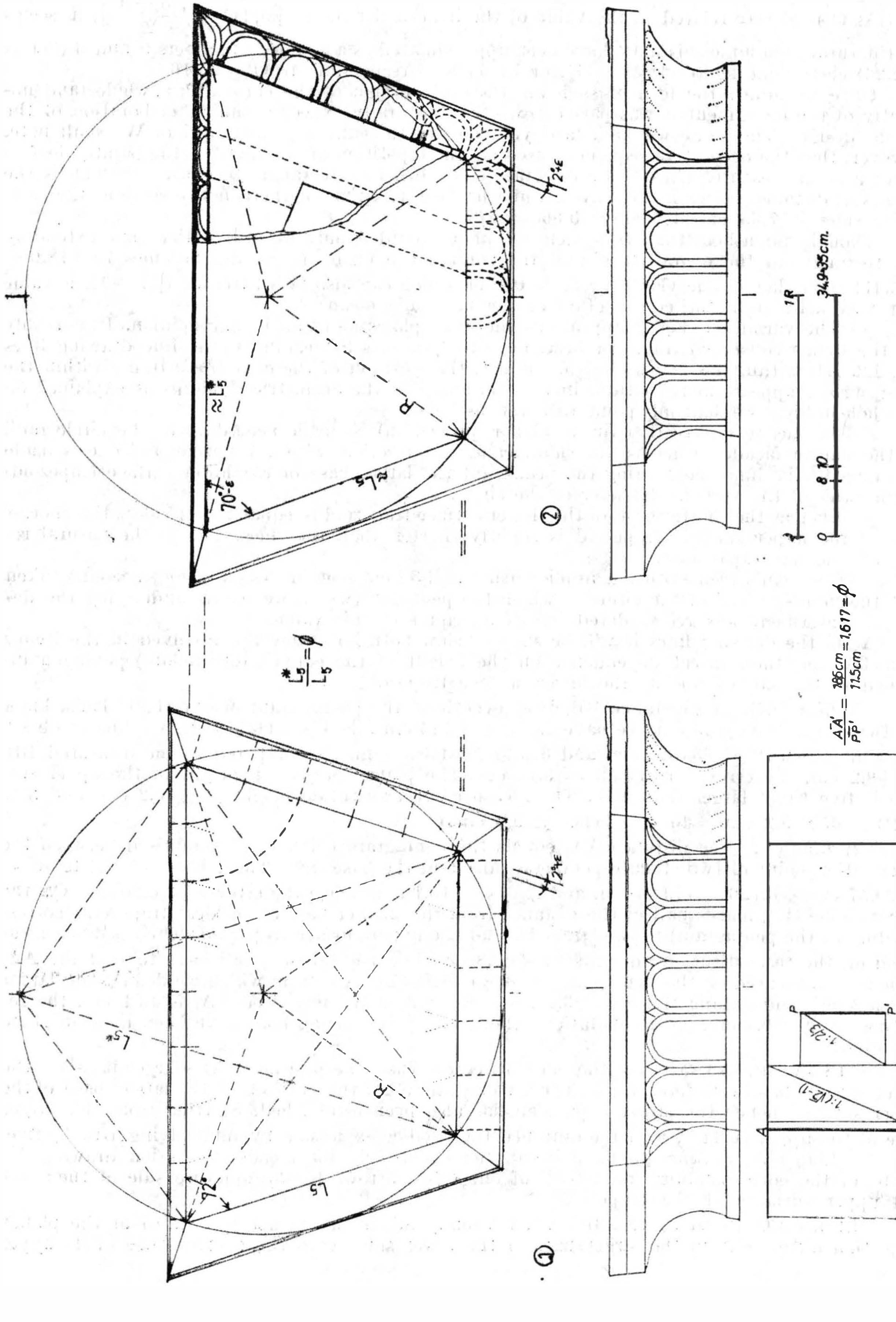

Fig. 3. — Variants for restitution: *1* angle α = 72°; *2* angle ≈ 70°.

As Ø is closely related to the value of the irrational number $\sqrt{5}$, $\left(Ø = \frac{\sqrt{5}+1}{2}\right)$, it seems most natural to assume this must have been approximated as a couple of numbers 9 and 4 (9/4 = = 2.25) corresponding to Ø = 13/8 [23], or by 17/8 corresponding to Ø = 25/16.

Once we admit the idea of such an elaborate design of the corona as a whole (and implicitly of the monument it was part of), we shall naturally expect a similar elaboration of the façade design. The cues we have are yet too few to make any assumption. We shall note, however, that the decorative sequence based on the repetition of one motif — the painted leaf — is not a casual feature. Thus, if we integrate this motif in a rectangle the base of which is the interaxial distance between the leaves, while its height is that of the concave section, the ratio of its sides is 7.65 cm/11.5 cm = 0 665 = 2/3.

Though a mathematical coincidence cannot be ruled out, we still notice that extending this rectangle to the overall height of the corona, the ratio of its sides becomes 7.65/18.6 = = 0.411 (or either in dactyls 3.5d/8.5d = 0.411), which can also be written as $(\sqrt{2} - 1)$, a value that may arise from the construction of the harmonic means [24].

(c) The variant in Fig. 4 appears as the most plausible of all in our opinion. It not only fits the item's conserved fragment best, but also provides a meaning to the fine drawing lines (L1, L2, L3) within the item's design. Besides, the position of the *anathirosis* frame within the lower surface appears more natural in this variant. As the geometric structure is explained on the whole in Fig. 4 we shall only point to a few aspects :

— The façade intersection (in a planar projection) is made according to the circle radii for the shorter façades, whereas the side façades' intersection with the "principal" one is made according to the lines connecting the peaks (at the larger base of the lower surface trapezoid) to the peak of the vertical diameter of the circle.

— Whereas the shorter base of the lower surface trapezoid is equal to its sides, the shorter base of the upper surface trapezoid is slightly shorter than the sides. This is the natural result of unequal expansions.

— The item's reconstitution implies using a ±35 cm feet in design sizing, account taken that the "unit-radius" of the circle in which the pentagon (which we see as underlying the design) is inscribed, was reconsidered by us as equal to this value.

As to the drawing lines it will be shown below both how they are involved in the item's geometry and their direct dependence on the height of the convex (or stellate) pentagon inscribed in the same circle as the lower surface trapezoid.

(1) *Line* (*L1*). The distance $\overline{BB_1}$ is a seventh of the pentagram height (H*). Thus, knowing that for 1 R = ±35 cm, we have L_5 = ±41.145 cm and L_5^* = 66.572 cm we finally obtain H* = L_5^* × sin 72° = 63.311 cm, and 63.311/7 =9.045 cm. As compared to the measured $\overline{BB_1}$ of ±9.2 cm, the error is as small as 0.15 cm. The planar projection height of the upper surface is five times larger than BB_1. The measured reconstitution height is ±46.2 cm, and 5 × × $\overline{BB_1}$ = 5× 9.2 cm = 46 cm, hence a 0.2 cm error.

(2) *Line* (*L2*) The distance $\overline{AA_1}$ equals the pentagram height part comprised between the intersection point of two stellate pentagon sides and the base (h*). Thus, h* = L_5/2 × tg 36° = = 20.57 cm × 0.726 = 14.944 cm, and $\overline{AA_1}$ = ±15.1 cm, hence the error is of 0.20 cm. On the design, Line (L2) marks half of the distance from the smaller base of an ideal trapezoid (corresponding to the pentagram) to the larger base of the upper surface trapezoid. This distance measured on the reconstitution amounts to ±42.8 cm. For a check we shall have to find the $\overline{AA_1}$ dimension measured on the item. Thus, ±42.8 cm/2 = 21.4 cm from which we deduct the larger "expansion" and obtain 21.4 cm — 6.4 cm = 15 cm. As the measured AA_1 is 15.1 cm, the resulting error is 0.1 cm. As a conclusion, the item's plane sizing may have been done in stage as follows :

— Using $\overline{BB_1}$ to start from the ideal trapezoid base, the position of the larger base of the lower surface has been determined. Then, using line (L2), the position of the larger base of the upper surface, hence the larger expansion has also been established. Starting from this larger base of the upper surface, we have obtained the smaller expansion by multiplying $\overline{BB_1}$ by five.

(3) Line (L3) appears to have been used exclusively for façade decoration drawing, by means of the corresponding "interaxis" of one side's arrows to the opposite side of the lower and upper surfaces of the trapezoid.

Distance $\overline{CC_1}$ (from L1 to L3) is not randomly taken, but rather as a third of the planar projection distance from the larger base of the lower surface to the shorter base of the upper

[23] See n. 22.

[24] L. Frey, *op. cit.*, p. 299, f. 6; concerning $\sqrt{2}$, see n. 22.

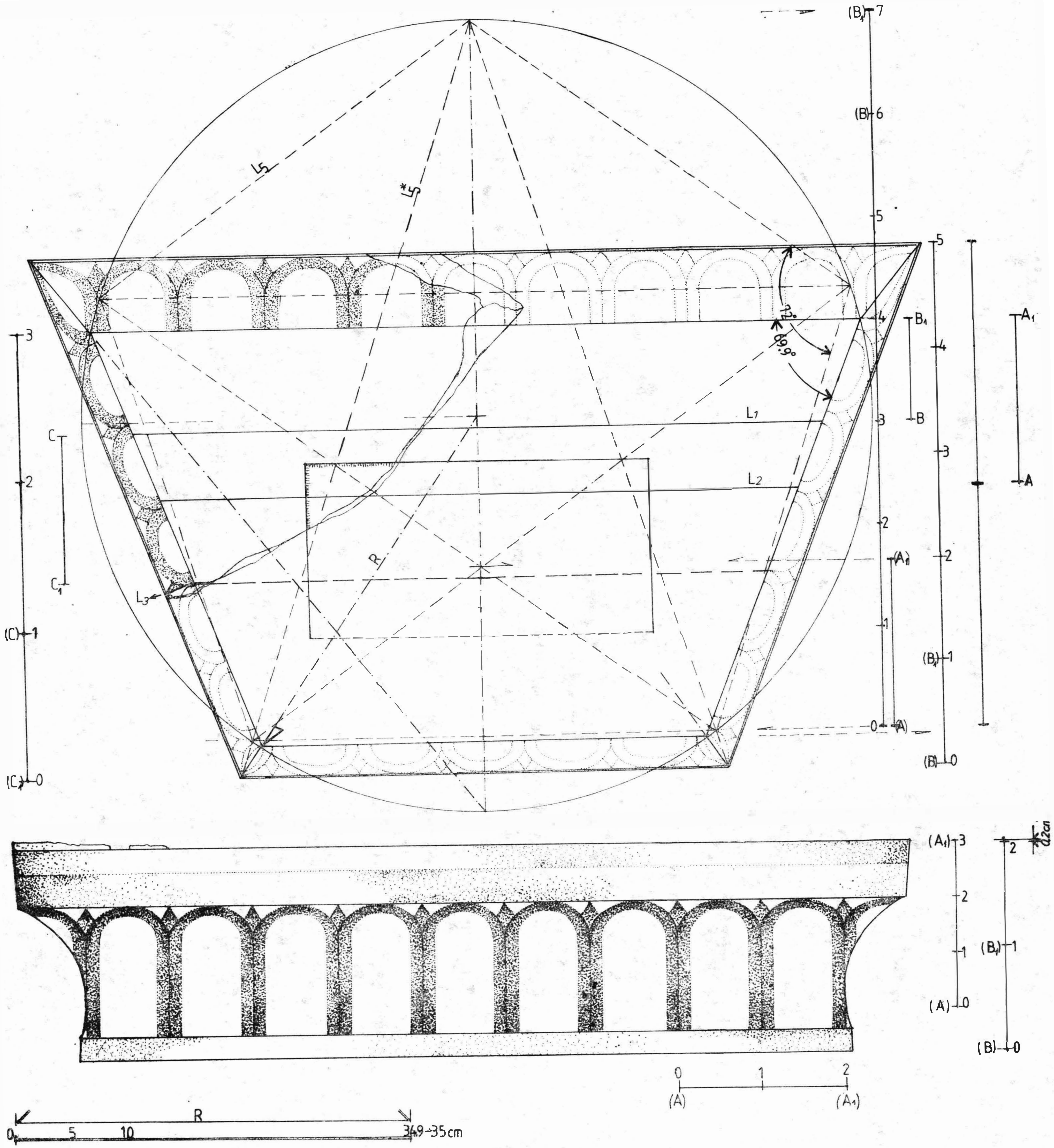

Fig. 4. — Variants for restitution.

surface trapezoid. Thus $\overline{CC_1}$ = (24.1 cm × sin 69.9° — 9.2 cm) = 22.6— 9.2 = 13.4 cm and the distance between the above bases is (±37 cm + 2.8 cm) = ±39.8 cm. It follows that 39.80 cm/ /3 = 13.26 cm (with an error of 0.14 cm).

(4) $\overline{AA_1}$ and $\overline{BB_1}$ are likely to have been equally used in façade siting. Thus,

— the total façade height (18.6 cm) is about equal to 2 × $\overline{BB_1}$ since 2 × 9.2 = 18.4 cm, with a resulting error of 0.2 cm;

— the façade higher section height (5 cm) is $\overline{AA_1}$/3 since 15.1 cm/3 = ±5.03 cm, (with a 0.03 cm error as compared to 5.00 cm. The leaf interaxis is about equal to $\overline{AA_1}$/2 since 15.1 cm/ 2 = 7.55 cm (with a ±0.1 cm error as compared to ±7.65 cm.

5) A concern for the "golden section", expressed by using the pentagram itself as design basis, is also manifest in the choice of the drawing system as well as in the sizing of the façades. Thus, $\overline{AA_1}/\overline{BB_1}$ = 15.1 cm/9.2 cm = 1.64, and the ratio of the total façade height over the concavity height is 18.6 cm/11.5 cm = 1.617 ≃ Ø.

7. Assuming the pentagon as a basic element in the geometric conception of the Histrian monument and knowing it is most likely dated in the last three decades of the 6th ct. B.C., it is not surprising that we should think of a Pythagorean influence [25]. If this was the case, the architect himself must have partaken — even as an initiate perhaps — of a community imbued with such ideas, which is all the more likely as the chronological sequence referred to coincides with the "Ancient stage" [26] in which the Pythagorean doctrine was prevailingly transmitted by word of mouth, in the form of the so-called "acousmata" (ἀκούσματα) [27] whose secret was jealously kept. At this point, one may even argue that the shape of the monument was deliberately selected to convey the symbolic message of the pentagram [28] to the insiders, while protecting it from unwithing onlookers [29], in perfect consistence with the esoteric coding requirements. That would indeed account for the configuration of this monument which, though relying on the pentagram, does not entirely reflect its geometry. If these hypotheses are accepted, the dating of the item may have to be revisited (or later, in the 6th c.t.). In the current stage of research, one may hardly believe Pythagorean ideas could have reached a region so remote from the "school" 's native Italian land as the Milesian colony of Histria, at so early a time as the 6th century B.C. Under the circumstances, the "Scythian destruction" would necessarily become the ***terminus post quem***. (see notes 6,12).

Anyway, the geometric conception of the Histrian monument seems to make true Plato's conviction that, "Should art be deprived from its arithmetics, measuring and weighing, it is not much that would be left of it".

[25] According to Ps — Appollodoros Pythagoras' mature age can be located around 532 B.C. (see M. Nasta, Introduction, in *Filozofia greacă pînă la Platon*, II, 2, Bucarest, 1984, p. 10—11).

[26] According to a periodization by B. Van der Waerden (in *Die Pythagoreer, Religiose Bruderschaft und Schule der Wissenschaft*, Zurich—Munchen, 1979) the "ancient period", includes philosophers between 530 and 440 B.C. (see also M. Nasta, *op. cit.*).

[27] *Ibidem.*

[28] On the pentagram, as the most significant symbol of the Pythagorean school, see Euclid, *op. cit.*, p. 242; M. Ghyka, *Estetica si teoria artei*, București, 1981, p. 51 sqq.

[29] For example, researches on irrational numbers, or "arrheta", "the unspeakable" as Ancient Greeks called them were regarded as hidden among Pythagoreans (B. van der Waerden, *op. cit.*, p. 69 sqq).