HANS
KAYSER

PAESTUM

THE *NOMOI* OF THE THREE ANCIENT GRECIAN TEMPLES AT PAESTUM

"The column shaft, and then the triglyph rings;
I do believe that all the temple sings"
Goethe, Faust II

Translated by Ariel Godwin
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1. ARRIVAL

Dear reader and friend,

> “Come, children, let’s be going,
> The evening’s near at hand.
> ’Tis dangerous remaining
> Here in this desert land.
> Pluck up your courage to wander
> Into eternity
> From one force to another,
> The end all well will be.”

Coming out of the hubbub of Naples, the train to Salerno speeding into the ever wider and calmer landscape of Magna Graecia, passing a long, dark, almost menacing wall, and then sighting my goal: Paestum—having arrived, I now sit on the terrace of a small hotel built into the 2,500-year-old city wall, watching the moon rise over the temple field. Why do the words of the northern mystic Tersteegen come to my mind? An indescribable silence reigns far and wide, with no other guests present, the few visitors having long ago departed by car or train, the only sound being the occasional hooting of an owl from atop the lofty pediments of the Temple of Poseidon. Tersteegen had surely never seen a Greek temple; this world would have been wholly foreign to him. Why are his verses ringing in my ears? Was I remaining in danger in a desert land, did I flee from my own confusion, from the terrible hopelessness of today’s political situation, from the madness of this entire European civilization, toward a holy sanctuary of eternity? Did I wander here to pluck up my courage in front of the *harmonía aphanēs*, the secret harmony of these stony witnesses to the heights of human achievement? Will all be well in the end, if my spirit can assimilate the melody of this day’s ending?

But the shadows of night descend further, and the two temples blend together, no longer recognizable as individuals, as if seeking protection in one another beneath the ghostly moonlight. And suddenly I hear Cassandra’s cry from Aeschylus’s *Agamemnon:*

> “O thou God, O thou Fate,
> Apollo! Apollo!”

O fate of this temple, this city, and the people who inhabited them! Except for the three sanctuaries, nothing but rubble is left, and we no longer know the names of the gods who dwelt in the cellae behind the columns; we know hardly anything of the history of this city, though for centuries it was must have been home to a flourishing culture and a bustling daily life—and yet: Apollo, the god of measure, beauty, and harmony, stands behind the ruins as a spiritual and creative power. Cassandra, the unhappy prophetess, was not reproaching him or his power, but rather the fact that he had driven her to the fatal house of the Atrides, in which she saw a ghastly fate approaching.

For a long time yet, I meditate in the magical light. Past, present, and future meet—and so my thoughts spin round and round. South and north! The three Fates, Clotho, Lachesis, and Atropos, daughters of Zeus, weave destiny in the south, as do the Norns in the north, Urd, Verdandi, and Skuld, beneath the World Tree Yggdrasil.

Book I, Ch. 1, 8: “Music, also, the architect ought to understand so that he may have knowledge of the canonical calculation of *tones* and their mathematical relationships.” But *kanōn* = canon means monochord in ancient Greek music theory! Euclid, the great Greek mathematician, wrote an essay, still surviving, on *katatomē toũ kanónos*—the division of the canon, in which the divisions of the monochord are described in detail, along with their tone and number ratios. Modern critics (e.g. G. Hartlaub), who deny any connection between tone and number by Vitruvius—simply because Vitruvius did not append the tones to the numbers—have ignored this passage, or simply not understood it in its true meaning, perhaps because they have read the original Latin text incorrectly (“. . .*uti canonicam rationem et mathematicam habeat*”). In their defense it must be admitted that Vitruvius himself probably never knew or understood anything of the monochord’s “*canonica ratio,*” otherwise he would have derived architectural proportions in the simplest way possible: from this same monochord, Pythagoras’s traditional experimental instrument.

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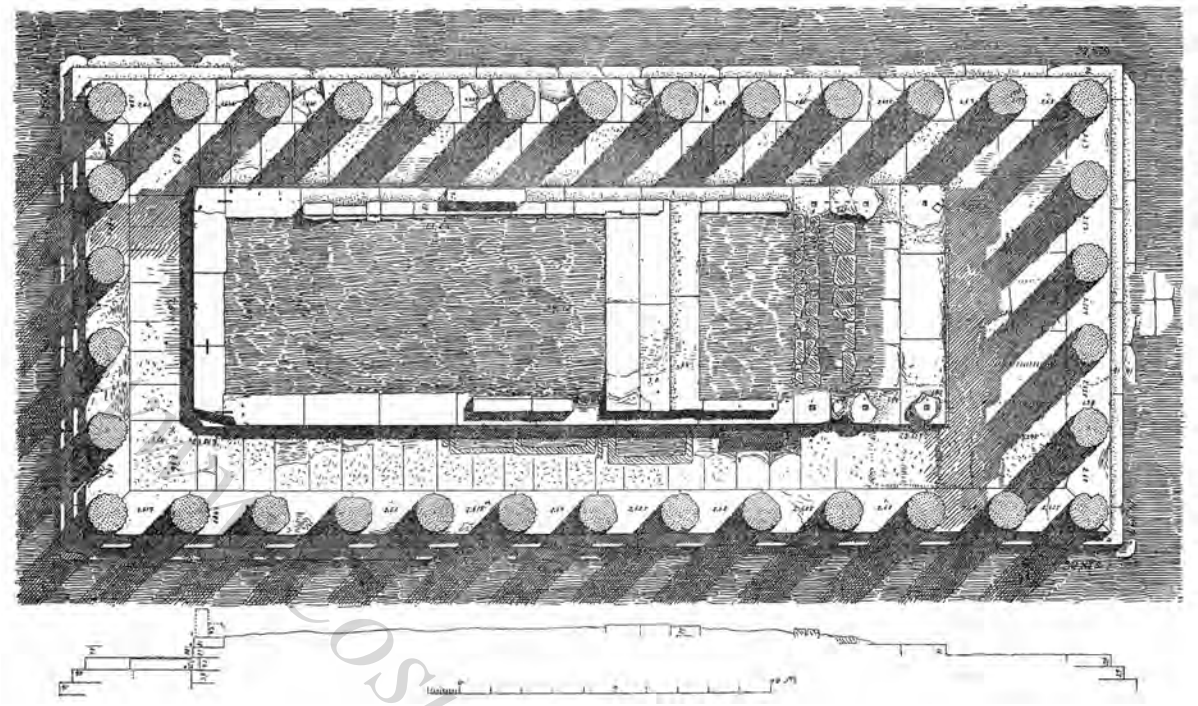
Having completed this admittedly rudimentary and incomplete historical excursion, let us return to Master Goethe. In his *Maxims and Reflections,* we read: “A great philosopher spoke of architecture as *frozen* music, and must have caused plenty of head-shaking thereby. We believe we can no better rephrase this beautiful idea than when we call architecture a *silent musical art*.

“Think of Orpheus, who, having been shown to a great empty site, wisely settled at the most appropriate spot and formed a large market place all around him with the enlivening notes of his lyre! Great stones, swiftly seized and torn from their massive unity by the powerfully commanding, amiably enticing notes, were compelled to form an artistic and well-crafted structure, and they moved with enthusiasm to arrange themselves into rhythmic stacks and walls. And thus is street added upon street! And nor will protective walls be lacking.

“The notes die away, but the harmony remains. The people of such a city wend their way amidst eternal melodies; the spirit cannot fall, activity cannot sleep, the eye takes over the function, duty, and charge of the ear, and on the most ordinary day the citizens feel they are in an ideal condition; without reflection, without having to inquire into the origin, they partake in the loftiest of moral and religious delights. Get used to walking back and forth in St. Peter’s, and you will feel an analogue of what we have dared to express here.”

Now, let this vision of Goethe’s accompany us into the temple field of Paestum!



Ground plan of the Temple of Ceres, from Koldewey and Puchstein.

AKROASIS

Length : width : height

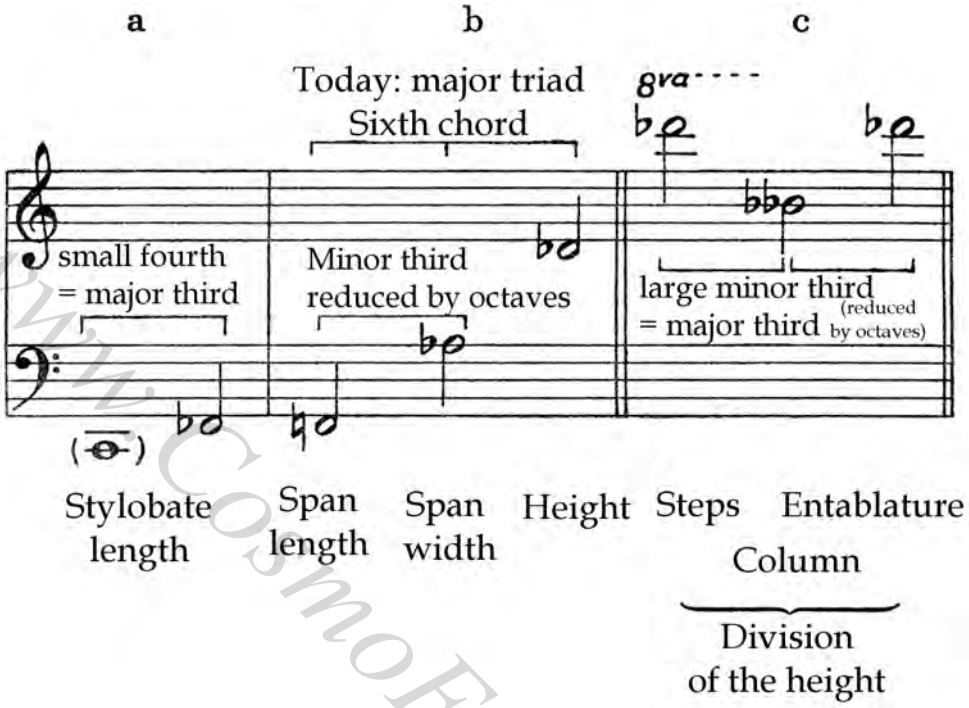
The measurements are:

Length (along the stylobate, highest step)
32.887 m (Krauss)
= 100 Pheidonic feet
Width (across the stylobate)
14.541 (east); 14.530 (west) (Krauss)
= 44.2 Pheidonic feet
Height
30 feet, where 1 foot = 328 mm (Riemann, p. 3) (2 parts entablature, 5 parts column, 1 part steps)
= 9.84 m

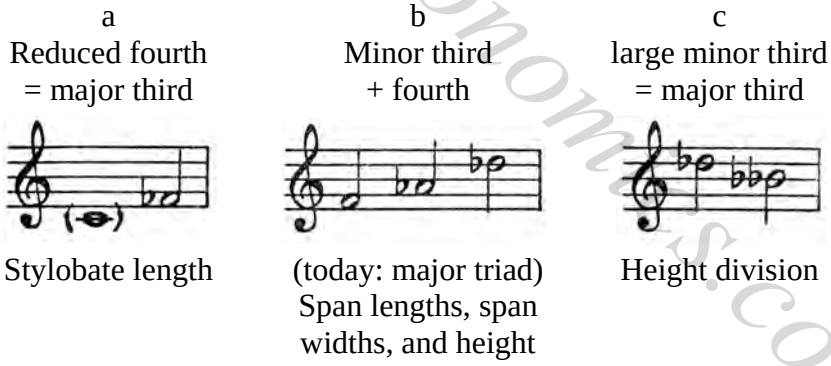
The length of the temple measured at the stylobate, 32.887 m = 100 Pheidonic feet, is so remarkable that F. Krauss called it the “contractor’s measure of order.”

If we convert the metric measurements of the width into Pheidonic feet, with the foot measurements of the length (100) and the height (30) fixed, then we get the number 44.2 (width in feet). But surely the architect did not intend this proportion; because for a rational, harmonic proportion, we must round the width up to 45, a difference of 0.8 feet (which is admittedly not very much, equivalent to ca. 26 cm), from the total width of 1454 cm:

If we put these notes in order according to their pitch and place them in our tempered notation system, then we hear the progression:



Intervals and chords reduced by octaves:



In his essay "Die Giebelform des sogenannten Cerestempels in Paestum" (in *Mitteilungen des Deutschen Archäologischen Instituts*, Rome, vol. 46, 1931), F. Krauss includes a drawing of the front of the Temple of Ceres (*ibid*., fig. 9) in what he calls "Ionian feet, western variation" (the foot being 0.352 m).

In this analysis, the ratio of seven (7 feet) emerges clearly as a determining multiplication factor, namely the pure triad:

3 × 7 = 21	Stylobate plus column height
4 × 7 = 28	Stylobate plus column height plus cornice
5 × 7 = 35	Total height of temple.

8. THE *NOMOI* OF THE TEMPLE OF POSEIDON

AISTHESIS

Walking from Paestum's train station through the gate of the Grecian wall into the ancient city, one sees something dark, heavy, almost menacing, far over to the left; this is the Temple of Poseidon. The nearer one comes to this venerable structure, the more this first impression fades away, and then standing before it, an entirely different feeling pervades the spirit: a magnificent sublimity, a finality, a perfect harmony of the whole and the parts. Indeed, every Doric temple that is still relatively complete in its structure gives this same impression to a certain extent. Among these, I can offer only the Temple of Concordia at Akragas for comparison, since I have not seen the others (Theseion, etc.) first hand. But for these two temples, the following occurred to me: compared to the Temple of Poseidon, there is something too conclusive, indeed almost sterile, about the Temple of Concordia, whereas the former temple emanates a supreme life force and desire for perfection. And behind this desire for perfection lies an enormous measure of spiritual power; indeed, the sublimation of all individual forms into one whole, singing in perfected harmony, is the singular and unrivaled impression conveyed by the Temple of Poseidon at Paestum.

I still remember the remarkable impression I had during my first walk among the temples 30 years ago. Stepping hither and yon, between the columns and the cella, climbing up and down the great steps of the stylobate encircling the temple and into the raised cella, looking up at the perspective of the edges and corners from inside the space of the temple, it seemed to me as if I was walking through the inner structure of a gigantic crystal—and in fact, as if the three-dimensional grid of this crystal was following in my spirit from one facet to the next, remaining forever the same despite the varying viewpoints. And then, when I found a point from which I could view all three temples from farther away, they appeared to rise as abruptly out of the ground as a perfectly formed crystal rises from the mother rock, and to have just as little in common with the surrounding landscape. See, friendly reader, if you can find in some mineral collection a dark and shiny magnetite crystal jutting out from the light surface of a piece of crystalline schist, the former having no similarity at all to the latter; then you will see what I mean. Now, of course, I know that it was not the law of crystals that I believed I was seeing or feeling in the Doric temples, but rather the sound of the norms that rang through the crystalline presence of the temple.

The Temple of Poseidon is the youngest of the three Grecian temples of Paestum. Krauss dates it to between 460 and 450 BC, thus predating the construction of the Parthenon in Athens.

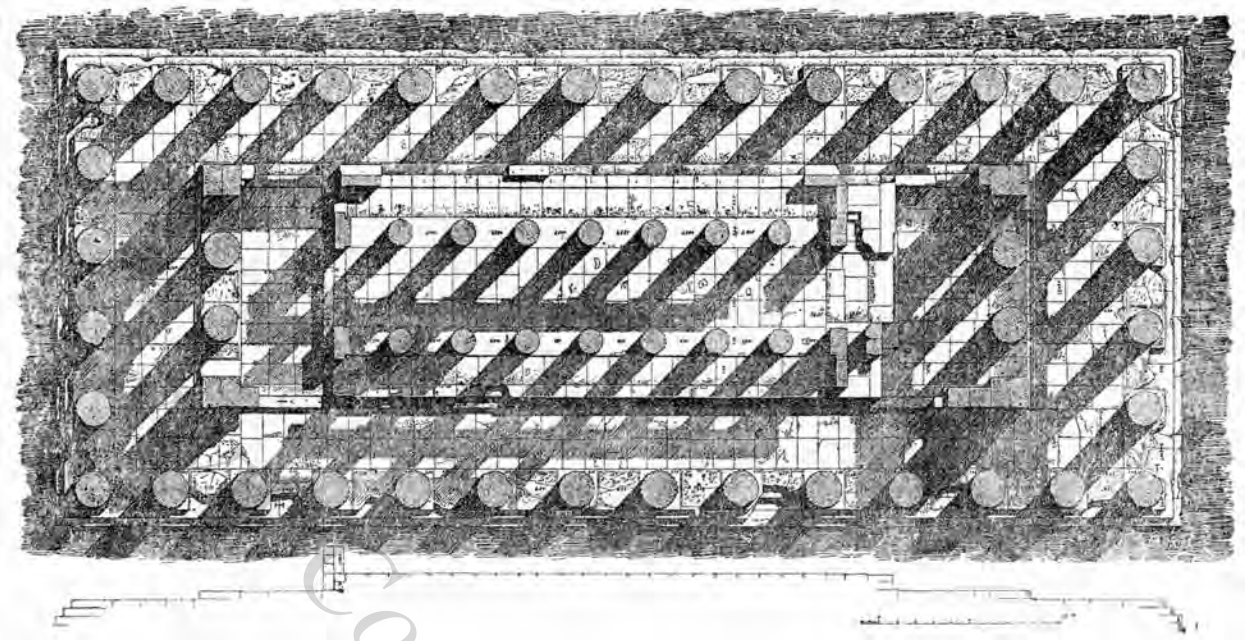
H. Riemann (*op. cit.*, p. 96) writes of the architect of the Temple of Poseidon: "This was an entirely original and self-willed artist." Earlier, in Chapter 4, we quoted M. Raphael's homage to this "personality to be counted among the greatest geniuses of the human race." In gratitude to Friedrich Krauss, who remains the best and most praiseworthy scholar of the three Grecian temples at Paestum, I will conclude the final "Aisthesis" of this book with the following passage from his work (*op. cit.*, pp. 61-62):

"The Temple of Poseidon exhibits something new in relation to the other archaic temples: here, each part, as well as the whole, is pervaded by a uniform spirit, and solely the essential is expressed in a great simplicity. In order to express it completely, *all* means for refinement are applied, and the remaining pattern is entirely filled with its own life. That which was learned and

accomplished will never become visible through naive zeal; it vanishes as a matter of course behind the mature seriousness which, on a higher level, reveals a more extensive knowledge of greatness and perfection. The way from the archaic to such a mature condition is more than a simple evolution; here something new must be added. The archaic age itself was heading toward a final condition, a depletion, as the Temple of Ceres at Paestum shows, and from there no path led further, unless there be a rebirth. And this came to pass in the breaking up of Greece, around the time of the Persian war, a time when all things handed down were taken over by new things, and appropriated and transformed in the literal sense. Where once events were observed from outside and depicted precisely, there was suddenly the inner connection, a spiritual condition, resting in itself or dramatically emotional. Architecture was also touched by this new life, and it appears at Paestum in its full development at the Temple of Poseidon. What had been an assembly of details in the Basilica, an outer delimitation at the Temple of Ceres, became a composition built around an inward center of power in the Temple of Poseidon. Only thus was it possible for the opposing forces of tension and harmony, although individually perceptible, to enliven the image of the temple together pervasively, not as a contrast to each other but completing each other. But harmony and tension are achieved by means, which are not to be derived from imagination alone, but into which experiences of the observation of completed works are assimilated. Yet nothing here is done for the observer, since all efforts are applied only to the complete appearance of the temple as a whole; it will be equal to that which emerges of itself from the characteristics of the observer's being, but this will never be subordinated to a concept of beauty ordained and set loose by the observer. This mindset belongs to the short time of the elevation and unification of all the strength of the Greek being, which expressed itself in this austere style. But full mastery requires a longer period of experience within this epoch. Its end, although not showing the slightest sign of a diminution of strength, must have been at the time of the Temple of Poseidon, the decade between 460 and 450, a time of full and wholly perfected existence, in which the bonds of an order not ordained by humans were still known.

"Intensity and harmony, the taut string and resounding chord together, define the appearance of the Temple of Poseidon, and in Paestum, indeed in all of Magna Graecia, only the Temple of Poseidon can hold good today as the image of the musical structure:

> 'The column shaft, and then the triglyph rings,
> I do believe that all the temple sings . . .'"



Ground plan of the Temple of Poseidon, from Koldewey and Puchstein.

AKROASIS

Length : width : height : column

As one approaches the Temple of Poseidon, gaining an impression of it from the outside and walking around it, one can see its main characteristic forms: the length, the width, the height up to the cornices (on the broad sides), the height up to the peaks of the pediments (on the front sides), and the outer columns.

The length of the temple, measured along the outer column bases on the stereobate, is 59.9 m according to Krauss, and the width 24.3 m. Krauss gives no indication of the height, but Koldewey and Puchstein offer the width : height proportion of 3 : 2—a fifth interval proportion which, after measuring good photographs of the front of the temple with a compass, proves to be correct. This reveals the height at the front, from the stereobate to the top of the pediment, to be equal to two thirds of the width: 24.3 / 3 = 8.1, multiplied by two, yielding 16.2 m. To find the height up to the cornice (on the broad sides), I added Krauss's measurements of the columns (8.88 m), architrave (1.48 m), and frieze (1.433 m), making for a height of 11.793 m up to the underside of the cornice. The column height, as noted, as 8.88 m.

We will now listen to these heights as string lengths on the monochord, in order to receive an initial akroatic impression.

If, on our 1200-mm monochord, we position these measurements:

Length	Width	Height up to top of pediment	Height up to cornice	Column
59.9	24.3	16.2	11.793	8.88

in centimeters. The last four yield such high tones that we can only hear them and distinguish their intervals with difficulty. Therefore we apply our tried and true method of octave

LIST OF PLATES

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City wall and temple field

Basilica

Temple of Ceres

Temple of Poseidon